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ABSTRACT

"Zero to Three" is a single-focus bulletin of the National Center for Infants, Toddlers, and Families providing insight from multiple disciplines on the development of infants, toddlers, and their families. Noting that America's babies and toddlers live in a world full of television sets, VCRs, computers, videogames, and interactive toys, this issue focuses on babies, toddlers, and the media, addressing the impact of media experiences on young children's development. The articles are as follows: (1) "Electronic Childhood: The Availability and Use of Household Media by 2-to 3-Year-Olds" (Amy B. Jordan and Emory H. Woodard IV); (2) "Peril and Potential of Media for Infants and Toddlers" (Daniel R. Anderson, and Marie K. Evans); (3) "Infants, Toddlers, and Television: The Ecology of the Home" (Kelly M. Schmitt); (4) "The Truth about 'Teletubbies'" (Susan Linn and Alvin F. Puissaint); (5) "Computers, TV, and Very Young Children: What Impact on Development?" (Claire Lerner, Dorothy G. Singer, and Ellen Wartella); (6) "Toddlers and Computers: A Father's Wary Eye" (Kyle Pruett); and (7) "It's about Time! Computers as Assistive Technology for Infants and Toddlers with Disabilities" (Mary Wilds). Regular departments of the bulletin list Zero to Three publications, videotapes, and on-line resources, and announcements about Zero to Three staff. (HTH)

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ZERO TO THREE®

October/November 2001
Volume 22 No. 2

Bulletin of ZERO TO THREE: National Center for Infants, Toddlers, and Families

Babies, Toddlers & the Media

Electronic childhood—media in very young children's homes and lives

TV, computers, and other electronic media: What is their impact on infants and toddlers?

Computers as assistive technology for infants and toddlers with disabilities

Teletubbies—are educational claims supported by data?

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Editor's Note

America's babies and toddlers live in a world full of television sets, VCRs, computers, videogames, and interactive toys. How are parents shaping their children's earliest experiences with electronic media? What impact are babies' and toddlers' media experiences having on their development?

The truth is, we don't know. Research concerning children from 0-3 and the media is just beginning. With this co-edited issue of *Zero to Three* and through a collaborative research effort now in the planning stage, the Annenberg Public Policy Center at the University of Pennsylvania and ZERO TO THREE hope to help direct the attention of researchers, practitioners, parents, and policy makers to this important area of inquiry.

Several contributors to this issue of *Zero to Three* are true pioneers in the systematic investigation of babies, toddlers, and the media. **Daniel Anderson** began his groundbreaking observations of children's experiences with television in the home some 20 years ago; he, **Marie Evans**, and **Kelly Schmitt** continue to explore this territory. **Amy Jordan** and **Emory Woodard** document the availability and use of household media by two- to three-year-olds in a sample of 145 families; their findings suggest directions for a national survey of households with children from birth to three. **Mary Wilds**, drawing on decades of experience adapting available computer technology to meet the specific needs of children with disabilities, describes the "assistive technology" potential in commercially available infant/toddler software.

Another group of contributors to this issue are clinicians and early childhood development experts who are called upon daily by parents and educators for guidance in shaping babies' and toddlers' experience with electronic media. **Susan Linn** and **Alvin Poussaint** sharply criticize promoters of television programming for babies and toddlers who imply developmental benefits in the absence of data. **Claire Lerner**, **Dorothy Singer**, and **Ellen Wartella** suggest ways that parents and caregivers can use TV and computer software as more than "electronic babysitters"; they also underscore the importance of rigorous descriptive and experimental research concerning very young children and the media. Finally, **Kyle Pruett** (who in his capacity as past president of ZERO TO THREE and member of the Annenberg Public Policy Center's Advisory Board set in motion the Annenberg-ZERO TO THREE collaboration) uses his knowledge and experience as a child and adolescent psychiatrist and director of training at the Yale Child Development Center guide his two-year-old daughter's use of the "puter."

Co-editing this issue of *Zero to Three* has been a great pleasure for the two of us. Our colleagues at the Annenberg Center and ZERO TO THREE are now exchanging expertise and thinking about how best to advance our understanding of babies, toddlers, and the media. We hope that readers of *Zero to Three* will join us in this endeavor -- please send us your comments, describe your experiences, and share your ideas for directions to explore.

Amy Jordan and Emily Fenichel, Co-Editors

Correction: In the article entitled "Infant Mental Health at Hope Street Is Everybody's Business" in the August/September 2001 issue of *Zero to Three*, the Hope Street Family Center was incompletely identified. The Hope Street Family Center is a collaborative project between University of California Los Angeles and California Hospital Medical Center.

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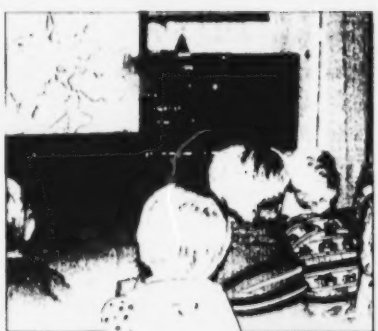

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Electronic Childhood:
The Availability and Use of Household Media by 2- to 3-Year-Olds

Consider the following information about media in the life of the 2- to 3-year-old:

- One in six has a television set in his or her bedroom;
- He or she will spend more than 4 hours each day in front of a screen;
- His or her parents are more inclined to subscribe to an Internet service than a daily newspaper.

Now consider the extent to which household media are being shaped to embrace the youngest family members:

- Public television is offering television programming geared to children as young as 1;
- A new "toddlerized" remote control is available for parents who want to give their children the ability to channel surf within preset boundaries; and
- "Lapware" (computer games designed for children as young as 9 months to be used while sitting in a parent's lap) has created a multimillion dollar niche market for the computer industry.

Media choices today are plentiful and American families have assimilated media into their homes and daily lives at an astonishingly rapid pace. But what are the consequences of media use for the growing child? What is the impact of ever-present media for the functioning of the family as a whole?

Why Explore the Media Environments of Very Young Children?

We currently know very little about which media are available to very young children and whether or how babies and toddlers engage with them. That is not to say there hasn't been widespread interest in the research. Huston and her colleagues (1998), for example, have argued that it is critical to understand media use by very young children; they lay out the many good reasons to do this research:

1. Social and intellectual development is probably more malleable in the early years than later. Thus, how very young children spend their time and what they attend to via the media can have important influences on development.
2. Babies and toddlers have less control than older children do over how they spend their time and what they spend their time with. Thus, it is important to see how parents govern the media choices available to children and the implicit messages they give about how, when, and why to use media.
3. There is greater individual variability in how very young children spend their time than in the more structured school years. If this variability in time use connects up with important consequences such as school achievement, then understanding variations in media use in the early years is critical.

Despite compelling reasons to look at media use in the early years, researchers rarely tackle the issue of media in the lives of babies and toddlers. There are some notable excep-

PHOTO: L.W. MCCARTY

tions, of course, particularly in the arena of television (see works by Anderson, 1998; Huston & Wright, 1998; Rice, Huston, Truglio, & Wright, 1990; Singer & Singer, 1988). Methodologically speaking, it is a difficult field to study. Getting a handle on how very young children spend time with media is a little like herding kittens—children this age go every which way. They tend to like to do a lot of things at once. They are notorious for their short attention span and distractibility. Getting valid reports about what children are actually consuming presents a real challenge—in part because children this age can't articulate how they spend their time with media. (For example, if you ask a very young child the usual question in TV-use research, "What did you watch yesterday?" you are likely to get a list that includes any program the child ever watched. "Yesterday" to the preoperational child is every day before today.)

Data From a National Survey of Parents of 2- and 3-Year-Olds

This article is an attempt to address the dearth of research on media in the lives of very young children by offering some preliminary data and suggesting paths for further exploration. The research presented here is a snapshot of media use in 145 families with 2- to 3-year-olds. The families represent a subsample of a larger, national survey of 1,235 parents of 2- to 17-year-olds[1] (Woodard, 2000).

Among the 145 families, over half (52.4%) had a child 2 years of age; the remainder had a child 3 years of age. There

at a glance

- This article offers preliminary data on media in the lives of very young children, using a sample of 145 families with 2- to 3-year-olds.
- Televisions and VCRs are virtually universal in American homes, but young children's access to computers, the Internet, and daily newspapers varies with family structure, income, education, and race.
- Studies that use a range of research methodologies to learn how children from 0-3 spend their time with media can be a step toward developing research-based guidelines for very young children's media use.

were equal numbers of boys and girls in the group. The average annual household income was $52,044 and the parents had an average of 13 years of education (a high school diploma plus one year). Over half (55.2%) of the 2- to 3-year-olds were the only child of the family, one third had an older sibling, and the remainder had a younger sibling. Almost three fourths (71.6%) of the families were white, 13% were Latino, 12% were African American, and the rest were other races (e.g., Asian, Native American, or mixed).

Media in the Homes of 2- to 3-Year-Olds

As Figure 1 indicates, media are prominent in homes with very young children. Not surprisingly, television sets are universal (so they are not illustrated in this or other figures). In fact, the average home had between two and three sets. What's more, 16% of the parents in this sample reported that their 2- to 3-year-old has a TV set in his or her own bedroom. Television "accessories" are also widespread in homes with very young children; videocassette recorders are in 95% of homes, and basic cable subscriptions provide additional channels to 73% of this sample.

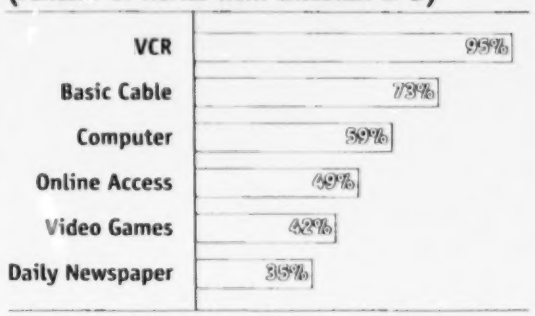
New media are less ubiquitous but are still very present in many homes of 2- to 3-year-olds. Fifty-nine percent of our respondents reported owning a computer and 42% own a videogame system. Forty-nine percent of the families in this sample have Internet service. By contrast, only 35% of homes with very young children have a newspaper subscription.

Family Differences in Media Access

We examined the impact of income, education, race, gender, and the presence of older siblings on young children's access to media. These are the demographic factors that have emerged as important in studies of older children's media use. The analyses revealed some interesting trends:

- Families with greater income and higher education tend to have more media. In our sample, 50% of families earn more than $40,000 a year. These families are more likely than lower-income families to have access to cable TV (80% vs. 69%), computers (76% vs. 51%), the Internet (58% vs. 45%), videogames (51% vs. 35%), and a daily newspaper subscription (50% vs. 28%).
- Parental education affects children's access to media, especially computers. Children from families where parents have more than a high school education are twice as likely as children whose parents have less than a high school education to have a computer (79% vs. 40%) or to have access to the Internet (66% vs. 31%).
- Differences in media access related to the child's racial background might reflect the income and education discrepancies that are common when comparing white and nonwhite homes. In our sample, white families tended to have more media than nonwhite families with two exceptions: videogames—nonwhite families were 20% more likely to have a game console—and bedroom television sets— nonwhite families were 18% more likely to have a TV in the child's bedroom.
- The presence of older siblings affects media access by 2- and 3-year-olds in some interesting ways. When a 2- to 3-year old has an older sibling, he or she is less likely to have a personal computer in the home (65% of children without an older sibling have a computer while 49% of children with an older sibling have one). Conversely only 35% of children without an older sibling have a videogame console while 55% of those with an older brother or sister have one. The presence of an older sibling in the household seems to have no effect on whether or not a 2- or 3-year-old has a TV set in the bedroom.

FIGURE 1: OWNERSHIP OF HOUSEHOLD MEDIA (PERCENT OF HOMES WITH CHILDREN 2-3)



Source: Fifth Annual Survey of Parents and Children (Survey No. 7), The Annenberg Public Policy Center of the University of Pennsylvania (Woodard, 2000).

The Use of Household Media by 2- and 3-Year-Olds

The availability of media in the home does not necessarily mean that the youngest family members are using it. For example, computers may be present in the home solely for use by parents or, as suggested by the above data, videogames may available primarily for an older sibling. We therefore asked parents to report the number of minutes, during an average day, that their child uses each medium.

Two- to 3-year-olds, like older children, spend the most time with television (see Woodard, 2000, for a review of how school-age children spend time with media). Parents report-

1 Roper Starch Worldwide conducted telephone surveys in the spring of 2000 for the Annenberg Public Policy Center of the University of Pennsylvania. The sample was drawn through random digit dialing of families from around the United States, excluding Alaska and Hawaii. The response rate for parents was 31%. Respondents were weighted to the March 1999 Census Bureau estimates on racial and ethnic groupings, educational attainment, and geographical region. In theory, in 95 cases out of 100, the results based on such samples of parents will differ by no more than 2.9 percentage points in either direction from what would have been obtained by seeking out all parents of children between the ages of 2 and 17. Because we are working with a subsample of this group, the margin of error is slightly larger.

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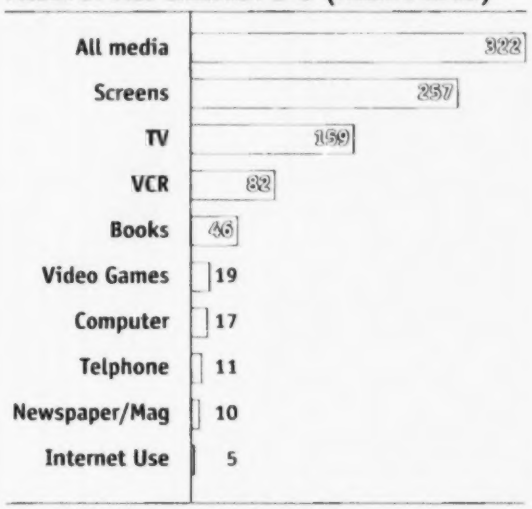
ed that their child watches an average of about 2½ hours (159 minutes) each day. Children this age also watch nearly 1½ hours (82 minutes) of videotapes. On average, parents reported that their child spends 46 minutes reading books; 19 minutes playing videogames; and 17 minutes on the computer, 5 minutes of which is on-line. Telephone use also figures into the equation (10 minutes), as do other print media such as magazines and newspapers (10 minutes) (see Figure 2). In all, 2- to 3-year-old children spend an average of almost 5½ hours each day with some form of media. More than 4 hours of that time is spent looking at a screen.

It is difficult to assess whether these numbers can be taken at face value. Much of children's media use activity may overlap (for example, a child may look at a book while a television program is on). In addition, parents may be over- or underestimating how much attention the child is actually paying to the media in question (for example, if a child is watching *The Lion King* for the 22nd time, he may only tune in to his favorite parts). Finally, parents often want to provide the socially acceptable answer when responding to an interviewer.

FIGURE 2: AVERAGE DAILY MINUTES SPENT WITH MEDIA BY ALL CHILDREN 2-3 (PARENT'S REPORT)



Source: Fifth Annual Survey of Parents and Children (Survey No. 7), The Annenberg Public Policy Center of the University of Pennsylvania (Woodard, 2000).

Individual Differences in Children's Media Use Patterns

With these overall patterns in mind, we again looked at demographic factors that might influence young children's use of media. In addition to household income, parental education, race, and the presence of older siblings, we also looked for the possibility of gender differences in media use.

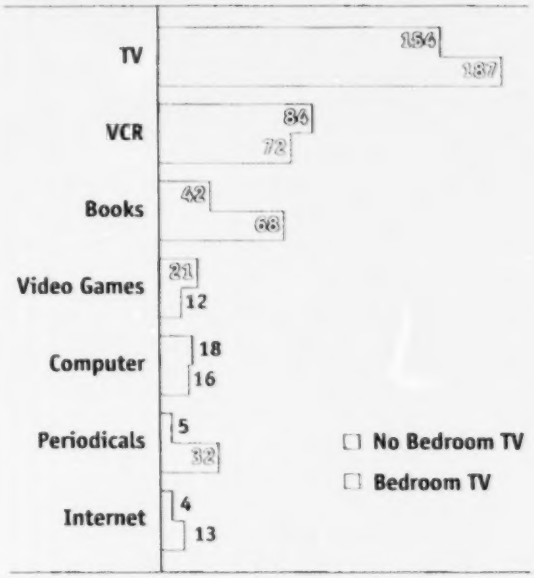
- Children from families with lower incomes watch, on average, 30 minutes more of television and 22 minutes more of videotaped programming, and spend 10 minutes more playing videogames when compared with children from families with higher incomes. Differences in use of other media were negligible.
- Children whose parents have a high school education or less watch an hour more of television on average than children whose parents have more education. The data suggest that children from families with less education spend more time with the VCR (14 minutes) and less time with books (12 minutes) and computers (16 minutes).
- Children's media use varied only slightly according to race. Nonwhite children devote more time to media overall, but the use is widely dispersed across all media rather than concentrated in one medium. Children from nonwhite families spend 23 minutes more per day with TV, 17 minutes more per day with periodicals, 13 minutes more per day with the VCR, 10 minutes more per day with the computer, 9 minutes more per day with the Internet, and 6 minutes more per day with videogames. As with the media availability data, these numbers may reflect differences in income as well as race. They may also reflect children's predilection to use multiple media simultaneously—particularly if they are located in the same area of the home.
- Parents report that their daughters spend more time than their sons with books (27 minutes), videotapes (20 minutes), television (17 minutes), computers (16 minutes), and the Internet (9 minutes). They report that their sons spend slightly more time with videogames (6 minutes) and periodicals (5 minutes), though these differences are quite small.
- The presence of older siblings in homes with 2- to 3-year-olds yielded no differences in use of media other than television. Children with an older brother or sister watch, on average, 20 minutes more per day of television than children without an older sibling. However, as Schmitt (this issue) reports, a 2- or 3-year-old who is in the room with an older sibling who is watching TV may or may not be attending to the program.

Other Factors Related to the Amount of Time Children Spend With Media

In addition to looking at the demographic characteristics of the family and the child, we also examined the impact of bedroom TVs and parents' time with TV on children's use of media (see Figures 3 and 4). As might be expected, children with bedroom TVs spend 33 more minutes watching television on an average day than children who do not have bedroom TVs. But their parents also report that they spend additional time with periodicals (27 minutes), books (26 minutes), and on the Internet (9 minutes). Children without bedroom TVs spent more time playing videogames (9 minutes) and watching videotapes (12 minutes).

Our examination of the relationship between parents'

FIGURE 3: AVERAGE DAILY MINUTES SPENT WITH MEDIA BY PRESENCE OF A TV IN YOUNG CHILD'S BEDROOM



Source: Fifth Annual Survey of Parents and Children (Survey No. 7), The Annenberg Public Policy Center of the University of Pennsylvania (Woodard, 2000).

television use and their children's overall media use is quite revealing. Children whose parents watch a lot of television (defined as 3 or more hours per day) spend significantly more time with media than those children whose parents are light viewers (defined as 1 hour or less per day). Most marked is the difference in television-related use (see Figure 4). Children of heavy TV viewers watch an average of nearly 4 hours of TV (230 minutes) and 2 hours of videotapes (124 minutes) while children of light viewers watch just over 1½ hours of TV a day (96 minutes) and less than 1 hour of videotapes (54 minutes). Children of heavy viewers also appear to spend more time with books, however (24 additional minutes).

Summary

The data from this group of 145 parents with 2- and 3-year-olds indicate that very young children live in environments that are heavily saturated with media. Virtually all homes had multiple television sets and videocassette recorders. The vast majority had basic cable service. In addition, approximately half of the homes in this sample had computers, on-line access, and videogames. Far fewer had a daily newspaper subscription.

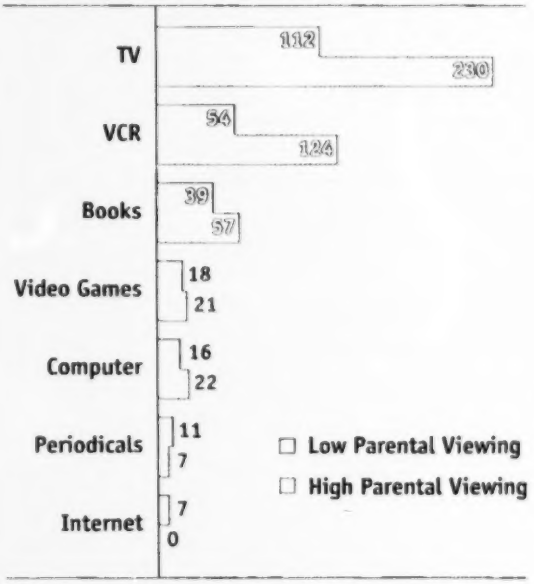
Though many of these homes may be outfitted with media for the enjoyment of older children, this is not necessarily the case. Only videogame consoles were more widely available when there was an older brother or sister in the home. And contrary to expectations, children who had television sets in their bedrooms did not typically share their room with an older sibling.

Parents report that their children are using the media that are ubiquitous in their environments. Two- and 3-year-olds spend, on average, over 2½ hours a day looking at a television or computer screen. And though they spend less than half that amount of time reading or being read to, their book and periodical time totaled nearly an hour a day.

As Huston and her colleagues (1998) predicted, children's allocation of time in the early years is far from uniform. Children from families with fewer resources spend more time watching television and videotapes than children with more resources. Nonwhite children spend more time with media overall than white children, though the differences are not dramatic. The presence of an older sibling in the household is also correlated with greater television viewing among 2- and 3-year-olds. And boys' media patterns are different from girls'.

It would appear from these data that some homes embrace media, particularly television, and children from these homes predictably spend more time with media. Parents who put television sets in their children's bedrooms and parents who watch a lot of television themselves have children who watch more television. Yet parents who report spending a lot of time with television also report that their

FIGURE 4: AVERAGE DAILY MINUTES SPENT WITH MEDIA BY PARENTAL TELEVISION VIEWING



Source: Fifth Annual Survey of Parents and Children (Survey No. 7), The Annenberg Public Policy Center of the University of Pennsylvania (Woodard, 2000).

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children spend substantial time reading or being read to—more than parents who are light TV viewers report.

Conclusions

The mass media are clearly entrenched within American homes with young children. In order to identify and maximize potentially positive roles that these media can play in the life of the developing child, we need to study much more closely how very young children spend their time with media. With the data presented here, we have attempted to provide a snapshot of what media are currently available to 2- and 3-year-olds, the kind of attention media receive, and patterns of media use that emerge in children with different family backgrounds.

There are limitations inherent in these data, however, that need to be addressed in future studies. Though the 145 families represent a national, random sample, they are but a subset of a larger study that had broader goals (specifically, tracking families' responses to children's media policies). It is important to conduct a large-scale natural survey in order to explore some of the nuances of family differences with a sample that is large enough to allow for more sophisticated analyses. There were not enough single-parent families in this subset of the national survey, for example, to be able to conduct valid comparisons of media use in young children of single-parent and two-parent families. It is also important to investigate *why* there are differences in media use between children. For instance, do children with fewer resources spend more time with media because they have fewer affordable ways to spend their time?

Research questions need to be developed and tested to get at the unique issues that are inherent in media use by very young children, particularly children *under* the age of 2, who are not represented in this sample. Moreover, we need a good understanding of how parents think about some of the terms that media researchers use. For example, how do parents define "viewing" in light of the fact that young children's attention to the screen is, at best, sporadic?

We will need to incorporate a range of research methodologies into studies of very young children and the media. While a large, national survey of parents of infants and toddlers is a necessary first step, it will be important to validate the information parents provide about what their young children are doing with the media. Research concerning older children has shown that parents underestimate the time their children spend watching TV, and that they do not often know the specifics of what their children are watching (Schmitt, 2000). In addition, what parents encourage their children to watch and what their children actually watch are sometimes two different things. Parents report that they encourage their children to watch programs that are specifically designed to be educational (e.g., *Blue's Clues* or *Sesame Street*) and yet, as we have seen with Schmitt's report (this issue) and with Nielsen ratings over time (Holz, 1998), children often watch programs that are not intended for them (there are, for example, a large number of 2-year-olds in the audience of *ER*).

Today's parents experience both the positive and negative consequences of media use by their very young children. Parents are also exposed to a public debate that provides confusing and sometimes contradictory messages about how parents should structure children's media use. They read about studies that show that exposure to educational television programs such as *Sesame Street* in the early years provides educational gains that last up to 10 years later (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). But they also read that the American Academy of Pediatrics recommends that children under 2 not watch television at all. They see educational software targeted to children as young as 9 months (see Wilds, this issue), but they also read that the Alliance for Childhood has called for a moratorium on computers in the classroom out of a fear that computers disrupt rather than support learning.

Debates among scientists, child development professionals, and others concerned with the experiences of very young children in their caregiving environments can be useful to parents (they provide a sense of the pros and cons of parenting decisions. But many parents and community caregivers also seek clear, research-based guidelines for media use as they attempt to structure home and child care environments that are positive and enriching for infants and toddlers. If we are to move beyond educated guesses (see Lerman, Singer, & Wartella, this issue), we must undertake careful and comprehensive research.

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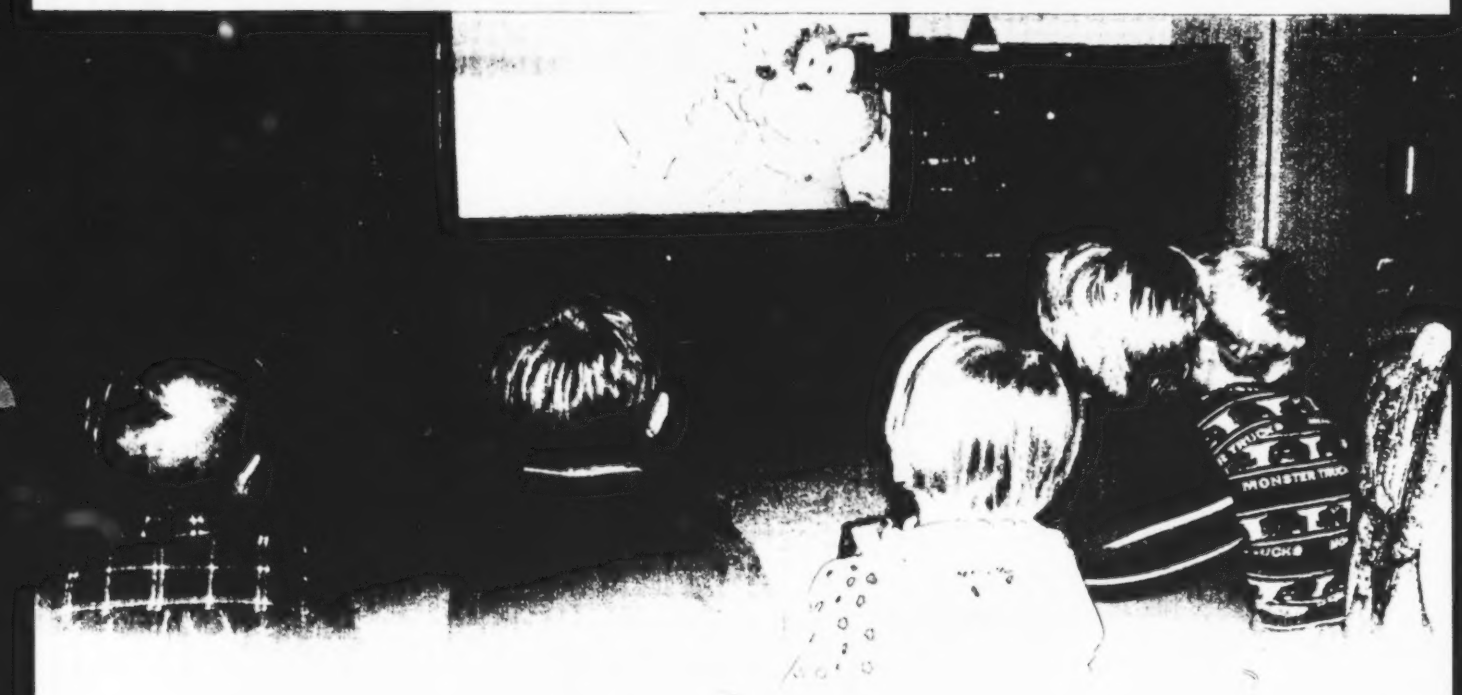
Peril and Potential of Media for Infants and Toddlers



At the beginning of the 20th century homes provided very different environments for young children than they do today. From one day to the next the sounds and sights were familiar, with little being new or novel. Insofar as there were media for infants and toddlers, they were probably limited to picture books and traditional toys. Aside from the hustle and bustle of large families as they began and ended the day's activities, homes were probably quiet places for young children. Family members provided audiovisual entertainment in the form of storytelling and music during times of leisure.

Throughout most of the 20th century, audio and audiovisual media have steadily entered homes. Phonographs, radio, television, videogames, electronic toys, computers, and the Internet have turned many if not most contemporary homes into electronic entertainment and information zones. Even when a family member is not actively using them, media may be present in the form of a television left on, the computer running a screen saver, a radio operating with no one listening. There may be little waking time in

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the lives of many infants and toddlers without the presence of media.

What is the impact of electronic media on very young children? There is surprisingly little research on use and impact of the media on infants and toddlers. In this article we summarize that research, most of it relating to television. We then speculate on the possible impact of contemporary and new media and argue the importance of future research.

Background and Foreground Exposure to Media

Very young children have two kinds of exposure to media that we dub *background* and *foreground*. Background exposure occurs when the child is incidentally exposed, as when the child is present as his mother watches a TV program. Foreground exposure occurs when the content is designed for young children and the child pays attention to and/or interacts with the medium. The best of our meager information about media exposure is focused on television.

In American homes a television is on about 6 hours a day, on the average. Because commercial ratings services do not provide data on children under 2, and because the data for 2-year-olds are usually combined with data from older preschoolers, there are few national exposure data for children under 3 (see Jordan & Woodard, this issue, for a recent small-scale survey). Evidence based on convenience samples from studies conducted in the 1970s and 1980s suggests that infants and toddlers were exposed to television about 2 hours a day, a substantial portion of their waking time (e.g., Hollenbeck & Slaby, 1979).

How much attention do very young children pay to television? In a University of Massachusetts study done during the 1980s, we installed video cameras in the homes of 99 families for 10-day periods of time. The video equipment was designed to simultaneously record the viewing area and the TV screen. We found that children under 2 years of age looked at the TV screen less than any other family members. Looking steadily increased with age until it reached a peak of about 80% of time with television by 12 years of age (Anderson, Lorch, Collins, Field, & Nathan, 1986). In a more detailed analysis of these data, focusing on children under 3, Kelly Schmitt (1995) found that looking increased linearly from 11% at 6 months of age to 39% at age 2 years (also see Schmitt, this issue). In laboratory-based research, we found a similar increase in looking with age as children were shown *Sesame Street* (Anderson & Levin, 1976).

Why does attention to television increase with age? Anderson and Lorch (1983) argued that young children are quite selective in their attention to television and that they tend not to watch TV content that they find incomprehensible. The great increase in looking at television, as children got older, reflected their cognitive and linguistic growth, which allowed them to comprehend ever-increasing amounts of programming. As children got older, television moved from the background to the foreground.

Since the 1980s, much more television has come to the foreground for very young children. In the 1990s as most homes obtained VCRs, videotapes directed at children under 3 began to appear. These tapes presented baby animals, performers singing children's songs, and a variety of other appealing subjects. Young children watch these tapes over and over again with little decrement in attention (Crawley, Anderson, Wilder, Williams, & Santomero, 1999; Mares, 1998). In addition, television programs were designed to appeal to younger children than were earlier preschool programs. Chief among these were *Barney and Friends* and *Teletubbies*. These programs have been extraordinarily successful in terms of sales of licensed products (Linn & Poussaint, 1999). This commercial success suggests that many more videotapes and television programs directed at very young children will be in the offing.

When it comes to other electronic media, we have been able to find no reliable information about very young children's exposure, attention, or interaction. To the extent that families use radio, stereos, videogames, and computers, these media are at least in the background. Based on the success of television for very young children, we can guess that there will be an increased effort to market content for other media. Certainly, audiotapes have long been available for babies and toddlers. Increasingly, computer software, such as *JumpStart Baby*, is being developed for use by very young children.

The Impact of Background Media

By definition, background media are those to which the very young child is not paying active attention and for whom the content was not produced. Do these background media have an impact? We think they might, but the research is minimal.

The most obvious impact is that of exposure to scary or inappropriate content. Although there is no research indicating the frequency with which infants and toddlers are exposed to such content, it likely happens. There is also no research documenting the effects of seeing horrible monsters, women being attacked and mutilated, or other horrors found in some entertainment television (especially movies). At the very least, exposure to frightening events on television, including those that appear on television news, likely reduces very young children's sense of security.

When infants and toddlers are not sleeping, eating, being bathed, having their diapers changed, or involved in another such maintenance activity, they spend their time at home in solitary play with toys or other objects, in social play with siblings, or interacting with parents. Virtually every theory of development, supported by large amounts of research, suggests that the quality of play and social interaction is a significant factor in cognitive, language, and social development.

When toddlers are in the presence of background television, play and social activity continues. In analyses of videotapes recorded in homes, we found that, when in the presence of a television in use, 2-year-olds spent 40% of their

time engaged in social activities and 32% of their time engaged in play (Woolf, Schmitt, & Anderson, 2000). The question is, what is the impact of background media such as television on the amount and quality of toy play and interaction? We see four immediate possibilities, of which three produce negative consequences. The first possibility is that the background media may distract the child. Visual and auditory changes, as well as motion detected in the visual periphery, can produce strong orienting reactions in which ongoing activity is suspended as the child orients to the source of the motion or change. It is possible that such orienting reactions disrupt very young children's ongoing play schemes, making it difficult for them to resume sustained play at a mature level. Such reactions may also interfere with parent-child interactions. Because television tends to have an auditory or visual change about every 6 seconds, the possibility of frequent disruptions is real. Frequent orienting reactions to television have been well documented in physiological research with adults (e.g., Rothschild, Thorson, Reeves, Hirsch, & Goldstein, 1986).

"Background" television—that is, programming to which the child is not paying active attention and for whom the content was not produced—may be a disruptive force in child development.

The second possibility is based on the observation that very young children's play and social interactions involve the use of language. During play, toddlers frequently talk to themselves. The speech is usually directly related to the children's ongoing play schemes. As children mature, this speech gradually becomes internalized. This early private use of speech has been theorized as being essential to the development of verbal thought and internalized self-control of behavior (e.g., Vygotsky, 1978). It is possible that background language from television, radio, or other electronic media may structurally interfere with this process of private vocalization during play. It may also more directly interfere with verbal social interactions.

The third possibility, although not intuitive, is that background media can actually *enhance* attention during toy play. Holly Ruff and her colleagues (1996) at the Albert Einstein College of Medicine found that 10-month-old infants actually increased the duration of their most concentrated form of attention during toy play when a slide projector to the side periodically presented slides as distractors. It could be that background media, although sometimes distracting, actually cause the child to more narrowly focus attention during play and, possibly, social interactions. In this case, it is remotely possible that children learn to selectively focus their attention on their ongoing play, effectively shutting out their other surroundings. It is not clear what the long-term consequences of such experiences are.

Finally, media that are background for the very young child may be foreground for the parent. Parent-child interactions may be substantially hindered by the parents' attention to content on a television, radio, or computer. Parents may have difficulty diverting their attention from interesting content and may therefore not notice occasions for productive interactions with their very young children. The children may be forced to either increase the intensity of their attempts to interact or to abandon these attempts.

While all these possibilities are more or less plausible, there has been no research that directly tests any of them. There is research indicating that parents who adopt a style of frequently changing the focus of their very young children's attention have offspring with poorer cognitive development (e.g., Landry, Smith, Swank, & Miller-Loncar, 2000). Background media could easily have this effect as well. In searching the research literature, we found three studies with infants and toddlers that recorded television use in the home in the context of studying parent-child interactions. Each of the studies reported a negative correlation of television set-in-use time and subsequent cognitive and language development (Carew, 1980; Gottfried, 1984; Nelson, 1973). In none of the studies, however, was television a focus of investigation. It is possible that the negative correlation was primarily related to parent education or other such factor. For example, as parent education increases, television use generally decreases. Since parent education is also related to children's cognitive and linguistic development, media use may not be a causal factor. Nevertheless, the negative correlations are suggestive that background television, and perhaps background media more generally, may be a disruptive force in child development.

The Impact of Foreground Media

In the past, children began regular TV viewing at about 2 ½ years of age (Anderson, Alwitt, Lorch, & Levin, 1979). Since then, the television audience of even younger children appears to be growing. Although there are no published data, we have heard from television producers and from parents that infants and toddlers are watching programs like *Blue's Clues*, *Teletubbies*, and *Barney* in large numbers. *Teletubbies*, in particular, appears to be optimized for very young children with its slow pacing, infantile characters, simple language, and repetition. A small amount of qualitative research indicates that very young children show high levels of attention and overt interaction with the program such as pointing and dancing (Gotz, 1999; Lemish, 1999).

With children ages 3 and older, we know that the effects of television depend very much on the content they view. Viewing violent content is associated with later aggressive behavior and school problems. Viewing educational content, such as *Sesame Street*, is associated with school readiness, lower aggression, book reading, and school success traceable

at least as far as high school (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). There appear to be few medium-general effects that are not due to content. One of these, however, is due to the sedentary nature of television viewing; heavy viewing is associated with obesity and lack of exercise (e.g., Dietz, 1993).

What is the impact of foreground media on children under 3? There are three major possibilities. One is that active use of media may displace other activities that are more (or less) valuable for development than media use itself. Another is that use of media may have a direct impact regardless of the content of those media. A third is that, as with older children, content determines the major impact.

In the absence of reliable information about infant and toddler media use, it is impossible to know to what extent activities such as object play, social play, or social interactions are being displaced. It should not be taken for granted, however, that because a child has *x* hours of media use, *x* hours of other activities are automatically displaced. For example, parents of toddlers may use a program such as *Sesame Street* as an opportunity to provide verbal labeling for their children (Lemish & Rice, 1986). Certainly toddler use of computers and the Internet, to the extent that it happens, likely occurs on the lap of a parent, with active parental involvement. In addition, as with older children, television viewing by toddlers may be timeshared with toy play and social interaction. It is clear that future observational and survey research on infant and toddler time use is essential to document the potential for displacement effects.

Some have argued that television, as a medium, has direct negative effects on children regardless of content. Shortened attention, reduced language development, and intellectual passivity have been hypothesized. Substantial amounts of research with children 3 years and above have failed to verify these claims (for reviews see Anderson, 1998; Anderson & Collins, 1988; Huston & Wright, 1997). Because there has been so little research with children under 3, it is impossible to conclude that these effects would not be found with toddlers.

Logically, many of the effects of media depend on comprehension of content. Comprehension by infants and toddlers, on the other hand, is not assured, or for most programming, even likely. One approach in understanding very young children's comprehension is to ask at what age children discriminate comprehensible from incomprehensible television programs. Anderson, Lorch, Field, and Sanders (1981) created incomprehensible versions of *Sesame Street* segments by randomly ordering shots, by making the dialogue run backwards, or by substituting Greek for the English dialogue. We found that children as young as 24 months of age looked more at normal versions of the segments than they did at the same segments with reduced comprehensibility. This not only supports the idea that perceived comprehensibility is a major driver of very young children's attention to television, but that such young children are probably extracting some kinds of information from TV.

More recently, John Richards of the University of South Carolina showed either an excerpt from a *Sesame Street* movie or a computer-generated display of randomly moving forms and sounds to infants ranging in age from 6 to 24 months. Infants 12 months of age and younger showed the same patterns of looking and heart rate to both displays. At 18 and 24 months, however, children looked much more at the *Sesame Street* movie and showed heart rate patterns indicative of sustained and focused attention (Richards & Cronise, 2000). One implication of this finding is that only after 12 months of age do infants begin to discriminate a comprehensible highly organized TV program from a dynamically changing random audiovisual display. If this is the case, then we submit that there is little educational potential in television for infants 12 months of age or less.

After infants are a year old, they are able to imitate some things they see on TV. The TV is apparently much less salient a display than reality, because infants are more likely to imitate a real person than imitate that same person as shown on video (Barr & Hayne, 1999; McCall, Parke, & Kavanaugh, 1977). No such difference has been noticed for older children (Bandura, Ross, & Ross, 1963).

Toddlers are also surprisingly unable to apply a video display to the real, familiar world. Several studies have found that 24-month-olds fail to find a toy hidden in an adjacent room if shown or told where the toy is on television. The children have no trouble finding the toy if they watch through a window or are told where it is by a live person (Evans, Crawley, & Anderson, 2001; Schmitt & Anderson, in press; Troseth & DeLoache, 1998). This difficulty in applying information from television disappears by age 3 years.

We know nothing about the impact of media specifically developed for infants and toddlers. To the degree to which these media are designed to teach, then it is possible that the impact is positive. With respect to television, we are doubtful that conventional television is comprehensible to children much younger than about 1½ years, and even then, the research indicates that television may be substantially less understood than equivalent real life interactions.

at a glance

- Very young children have both "background" (incidental) and "forground" (the child pays attention to or interacts with the medium, and content is designed for young children) exposure to media.
- More TV programs and videotapes are being directed toward infants and toddlers, but we know nothing about their impact.
- Computer software for very young children, digital television, stand-alone interactive toys, and new computer programs and interfaces also demand careful study.

New Media

What about present-day interactive media? At this point there is no systematic published research about the amount or nature of very young children's use of computers, the Internet, or interactive toys. The lack of research probably reflects the fact that interactive media are not yet a substantial part of the lives of most very young children. Although these media are in the home and parents use them, new media receive substantially less attention from children than more traditional media, like the TV and VCR. Part of this comes from the difficulty a 1- or 2-year-old has in using the mouse as an input device.

Our impressions are that parents use computers two ways with toddlers: without and with parent mediation. An example of minimal parent mediation is to set the child up with a text editor or paint program to let the child see changes on the screen as he or she randomly bangs on the keyboard. There are also some programs that are designed for toddlers. In one program, for example, a balloon is blown up as long as the child holds down the space bar. If the child holds the space bar down long enough, the balloon pops. With programs such as these, parents can let their children play with the computer without active involvement on their part.

With other software, often referred to as lap-ware, the parent provides much of the interactive guidance as the parent and child explore interactive picture storybooks such as *The Tortoise and the Hare* or interactive computer environments that provide simple games and songs. For most babies and toddlers, such computer use probably accounts for little of their time. Consequently, there is probably not much impact. This is likely to change.

Infants and toddlers are not being left out of the technological revolution in media. These include changes in television as it switches to digital high-definition and interactive formats, standalone interactive toys incorporating substantial computational power, and computer interfaces that can be readily used by very young children.

Digital television. Broadcasters are presently under a federal mandate to convert their television broadcasts to a digital format. High-definition television, under the mandated format, provides a large screen breath-taking image and audio comparable to cinema. Digital technologies, furthermore, allow a variety of possibilities for making television interactive.

When digital television is in the background for very young children, the potential of its arresting images and sounds for disrupting play and social interactions is much greater than for present day television. If very young children can, to some extent, ignore present-day background television, they will likely be less able to do so in the near future. Assuming that adults will find the new video, audio, and interactive formats more engaging, then it is also likely that parents will find it more difficult to tear their attention away from TV to interact with their young children.

When digital television is in the foreground for very young children, it will presumably be somewhat more engaging than contemporary TV. It is likely that the digital aspects of television will be employed to provide interactions with toys along the lines of *Actimates Barney*, a plush toy that takes cues from the TV program *Barney and Friends* and invites the child viewer to sing or dance with the show. Since the toy responds to a wireless radio signal broadcast along with the program, it interacts in ways specific to each episode. The toy character verbally comments on or asks questions about the program, saying "Watch this," or "What do you think will happen next?" It also demonstrates activities performed on screen, by counting or singing along with the TV characters. Research has shown that 2 and 3-year-old children interact more (dancing, verbal or nonverbal responding) with an episode of *Barney* or *Teletubbies* in the presence of an interactive *Barney* or *Teletubbies* character (Strommen & Alexander, 1999).

Given that we know so little about the impact of contemporary foreground television on very young children, it is difficult to know how digital developments will change that impact. It is likely that some of these developments will make television even more engaging, and so more time may be spent viewing. It will be a great challenge to ensure that the programs these children watch provide content that is age appropriate and developmentally beneficial.

Standalone interactive toys. The development of interactive toys is in full swing. Increasingly, computers are embedded in toys, allowing them to respond to children. As of March 2000, 60 % of new toys released by Mattel Inc.'s Fisher Price unit had a computer chip in them, compared to less than 10% 3 years earlier. For instance, Fisher Price offers a "talking" sorting toy, for babies 9 months and older, that labels shapes and colors. Another example of an interactive toy that supposedly enhances development is Neurosmith's soft toy *The Babbler*, which makes speech sounds in Spanish, French, and Japanese and is motion-activated (Goldman, 2000).

Traditionally, plush toys can be attachment objects for very young children. Now plush toys are becoming increasingly socially interactive with their young owners. For instance, *Actimates Barney*, can, using a large vocabulary, invite children to play or sing songs. Toys such as *Furby* encourage verbal and other interactions; its vocalizations become tailored to the particular children using it.

We can only assume that the toys now available are only crude forebears of toys to come. If the past is any guide, toys will be deemed successful by manufacturers to the extent that they are bought. In our view, commercial success will come to those toys that captivate the child such that the child expresses delight and is occupied for long periods of time (the same rule, of course, has applied to TV programs). Such a successful toy may or may not be beneficial to development. What will be the impact of these interactive toys? While we can only speculate, the most obvious answer is that play with interactive toys will be different in nature than play with traditional toys. To the degree to which

development is influenced by play, then to that degree development will be influenced generally.

There seem to be two domains in which play with traditional toys may be different from play with standalone interactive toys. First, we predict that successful interactive toys can produce much stronger attachments than those produced by traditional toys such as teddy bears. Having a toy that responds to you, laughs when you laugh, asks what's the matter if you're crying, hugs you, and so on, seems to us a powerful attachment object. According to attachment theory, children's secure attachment to their human caretakers is an underpinning and potent predictor of their later emotional and cognitive well-being (Ainsworth, 1978; Bowlby, 1969). Caretakers facilitate secure attachment by responding appropriately and contingently to their children's behaviors and expressed needs, continually revising their behaviors in response to the children's development. It is hard to imagine how even a sophisticated toy can provide this quality of contingent interaction. We do not know the consequences of powerful attachments to interactive inanimate objects, or whether these consequences will be negative or positive, but this is at least an area of concern.

Ideally, an interactive toy should allow children to build their own creations or to explore the world in ways not possible with traditional toys. Will such toys be widely available for infants and toddlers?

The second domain in which interactive toys are different from traditional toys is in relation to imagination. The interactive toy reacts to the child and the child reacts to the toy. Traditional toys have meaning to the child only to the extent that the child imagines and provides that meaning. In other words, an interactive toy may produce only a series of concrete, relatively scripted (by the toy) reactions and interactions. Play with a traditional toy, on the other hand, is open-ended, with play schemes suggested by the toy's design, but not constrained by it. Traditional toys can be combined to produce a virtual infinity of possible modes of symbolic and social play.

The well-designed and researched interactive toy certainly has the potential to educate and stimulate children. Its impact, however, will depend on how well it exploits its new capabilities to foster developmentally beneficial activities. Ideally, it should allow children to build their own creations or to explore the world in ways not possible with traditional toys. Such a constructivist view is visible in the "smart" toys designed (for older children) by the MIT Media Lab, such as "programmable" bricks (*Lego's Mindstorm*). At this time, however, we remain to be convinced that such toys will be widely available for infants and toddlers.

New computer programs and interfaces. At some point digital television and computers will be merged (with television programs becoming a part of the content available on the Internet). This future technology will have large, high-resolution screens and encompassing sound. There are many foreseeable developments in this technology that will be relevant to very young children. Chief among these will be speech recognition technologies combined with movement capture systems. Speech recognition will allow the child to talk to the screen and movement capture systems will allow the computer/TV to recognize and respond to the child's behavior.

An early version of such a system allows for the creation of virtual playmates, such as SAM (the buildable/trainable peer, developed by the MIT Media Lab; Cassell, 2001). By storing information about the user, through interaction, these virtual entities will be able to respond to children in highly specific ways, through play or story sharing. Technologies like "smart" toys (which can be connected to the computer or stand alone) already allow children to interact with content on screen through toy play. These will soon be wireless with a seemingly magical ability to interact with the digital screen.

Given that 2-year-olds have no understanding of the symbolic nature of media (e.g., Troseth & DeLoache, 1998), these new media truly provide a virtual reality that, at a minimum, will blur the boundary between media and reality. Even adolescents are reported to be confused about the status of virtual characters in computer games (Turkle, 1995). Like our comments concerning standalone toys, to the extent that play with virtual playmates displaces traditional toy and social play, there is possible cognitive and social harm if these new media do not encompass and extend the virtues of traditional play. In addition, we suspect that strong attachments could be formed to these virtual playmates, and, as with interactive plush toys, such attachments have unknown consequences.

Conclusions

We know with certainty that healthy and successful development can occur without electronic media. We know with near certainty that electronic media can benefit the development of older children. We know little about the impact of contemporary electronic media on zero to 3s and can only speculate about the impact of new media.

Our comments about the impact of media on very young children have tilted toward the negative. This parallels discussions about the impact of television almost from its inception. It took the television industry about 20 years to develop a program that is demonstrably beneficial to children. *Sesame Street*, and consequently the many excellent preschool shows that have followed it, would not likely have emerged purely as the result of market forces. This history suggests that the

forces of child advocacy, developmental research and a caring government are going to be essential in producing beneficial new media for young children.

That said, our concerns are that background media are a disruptive influence on development, with this influence only intensified by large screen formats, encompassing sound, and interactivity that completely engrosses parents. We are further concerned about the possible impact of children forming strong attachments to electronic media, which are unlikely to provide the level of contingent, responsive, and emotional interaction so vital for positive social and cognitive development. As new media become increasingly realistic, we fear that the lines between fantasy and reality, already blurred, will become much more so. Finally, to the extent that media displace traditional play and social interactions, we are plunging very young children into a digital future, with unknown consequences.

At this point in time, there is no major research funding commitment by any government agency to understand the impact of media on older children and adolescents, much less on infants and toddlers. More than 20 years passed after the inception of television before *Sesame Street* was created. It took another 30 years for research to allow us to understand, if incompletely, both the beneficial and harmful effects of television. We are already beyond the threshold of the digital age for children. Will it take us 50 years to understand what we have wrought?

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INFANTS, TODDLERS, & TELEVISION:

The Ecology of the Home

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As a researcher for the children's television program *Sesame Street*, I have a somewhat special perspective on the dramatic changes in development during the first 3 years of life. I sometimes wonder: How does the child go from being a newborn who has never seen a TV screen to a 3-year-old who is able to learn letters and solve problems through watching Sesame Workshop programs? We know that this process has a great deal to do with the child's developing cognitive abilities (see Anderson, this issue), but we also know that the time young children spend with TV and the attention they pay to programming are shaped by the context in which they view the programs that are aired, their parents' attitudes toward TV, and the structural features of family life that influence viewing.

The context in which very young children experience television is part of the overall ecology of the home—the elements of the physical space and social context that shape what and how children develop in the context of the family. For example, parents vary in their views about television and the way it should be used with young children. Some encourage their children to watch educational TV (Murphy, Talley, Huston, & Wright, 1991); others may forbid or strictly limit TV watching of any kind, while still others do not mediate their child's viewing at all. Some structural features of family life—such as those dictated by parents' work schedules or the alternative activities available to children—may have profound influences on when, how much, and what TV is watched. For example, toddlers who attend out of home childcare watch fewer children's educational television programs than those who stay at home (Pinon, Huston & Wright, 1989). We must also remember that the media ecology of the home is changing with respect to infants and toddlers (see Jordan & Woodard; Lerner, Singer & Wartella; and Wilds, this issue). It is only in the last few years that television shows such as *Teletubbies*, videotapes such as *Baby Mozart*, and CD-Roms such as my own company's *Baby and Me* have achieved popularity with very young audiences.

In this article, I report on research I conducted on infants' and toddlers' viewing behavior as it naturally occurs at home. Understanding the context in which very young children view and the patterns of viewing they develop as they grow is critical for ultimately understanding the impact of TV on young children. Despite the importance of this topic, this is an understudied and underaccounted-for audience because it is so hard to get accurate measures without

obtrusive and expensive approaches. I have been interested in infants' viewing of television since I was a graduate student at the University of Massachusetts Amherst. In particular, how does early viewing develop? Do parents encourage infants to view or do they keep them out of the room when the TV is on? At what age do children begin paying attention to TV, and what draws their attention? And what else are they doing when they are in the viewing room?

at a glance

- Videotapes of home television viewing by 20 children (7-33 months of age) were coded for attention to TV and characteristics of programs watched.
- Sesame Street was the most frequent program airing when toddlers were in the room, but the second most frequent program they were exposed to was the news.
- Attention to TV increases with age; between 18 and 36 months, children become "TV viewers."
- Benefits of watching educational TV may increase when children watch with a parent.

While at the University, I had the unique opportunity to examine exactly what infants and toddlers do while they are in the television viewing room at home. I did this by examining videotapes that were recorded in the early 1980s for a larger study by Daniel Anderson (known as the "Home Viewing Study"), in which he observed the television use of 99 families in the Springfield, Massachusetts metropolitan region. In this study, cameras recorded what was going on in the viewing room (or rooms if the family had more than one TV) for a 10-day period. Every time each television set was turned on, one camera recorded what was happening in the viewing room while a second camera recorded what was on the television set.

I was introduced to the Home Viewing Study at the beginning of graduate school. Anderson, Patricia Collins (a doctoral candidate at the time) and I decided to examine attention to the "formal features" of television—that is, features that may draw a young child's attention to TV and then sustain that attention. In addition, we were interested in quantifying what children of various ages and adults did *while* they were watching television. After being trained to carry out coding, two other students and I spent the spring and summer of 1992 evaluating the 20 youngest viewers among 50 participants selected from the 99 "camera-in-home families" of the Home Viewing Study. Each child was typically in the viewing room for a few hours each day over the 10-day period, so it took several weeks to examine the behaviors of each viewer.

In the midst of this process, I became most interested in the infants—that is, children under two—I observed to be in the viewing room with their older siblings, whose behavior we were coding. Why were these children so frequently in the room with older siblings? Were they really watching TV, or was the set just on in the background? I decided to pursue these questions for my master's thesis and spent another year examining the Home Viewing data from this new perspective.

In total, videotapes of 20 children between the ages of zero and three (ranging from 7 to 33 mos.)[1] were coded for attention to television and characteristics of programs watched. Half of the children were younger than two (referred to here as "infants") and half were between two and three years of age (referred to here as "toddlers"). All of them had at least one older sibling. As Jordan and Woodard (this issue) have found, children with older siblings spend more time with television than those without. There were 13 girls and 7 boys in the group. The infant and toddler studies were carried out at different times and used different protocols.[2]

In this research both children's cognitive abilities and the ecology of the home were presumed to be important predictors of viewing. We used age as an index of cognitive development on the assumption that these young children were developing typically. We also assessed the factors of the home that "teach" children how and when to watch and the types of programs that were available to infants and toddlers on the screen. (Remember that, at this time, videocassette recorders and cable access were not yet universal so "television viewing" refers to what airs on the commercial and public broadcast stations.)

The data I report here are unique in part because it is so difficult to obtain information about infants' and toddlers' viewing at home. Nielsen's ratings data do not include children younger than two. In addition, parents may not be accurate in their estimates because, as will be discussed shortly, they may not even realize that their baby is watching when they leave the room. Having cameras in the home allowed for more accurate measures of time with TV and attention to TV.

There are, however, some limitations to analyzing 20 year old data. For example, although video cameras were placed in each room where a TV was present, today's families have many more sets. Most notably with respect to amount of viewing, many 2-year-olds even have a television set in their bedroom (Jordan and Woodard, this issue). Also, as more and more mothers have joined the workforce, infants and toddlers have come to spend more time out of the home in childcare. Much of their viewing may be taking place outside of the home, particularly if the child attends a home day care center. Additionally, there are more children's educational programs available today than ever before

[1] Infants younger than 6 months were not included because prior to this age attention is likely only driven by audio characteristics (Lemish, 1987). Also, infants were not included who were out of camera view more than 50% of the time (e.g., a chair blocked the view of the participant).

[2] Videos contained a picture of the viewing room, and every 18s there was a 6 second insert of what was on the television screen. The insert lasted approximately 6 seconds. Videotape coding of infants involved stopping the tape after the last frame of the video insert, such that looking at the screen was assessed approximately every 26 s. If the child was looking at the television, the formal features of what was on the screen was recorded. If the child was not looking, every fourth insert was coded for formal features. For the toddler study, after 5 cumulative minutes in the viewing room, the coder would code the last frame (s.) of the insert for formal features and the next frame (s.) for attention and other non-viewing behaviors.

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(Jordan, 2000; Schmitt, 1999). Nevertheless, there are no studies that would indicate that attention to TV or the behaviors exhibited are dramatically different from when these data were captured.

Exposure to television

The tapes of children in their natural environments indicate that infants and toddlers were exposed to a substantial amount of television, ranging from 13 minutes per day for the lightest viewer (an 11-month-old) to 2 hrs and 40 minutes per day for the heaviest viewer (a 32-month-old). On average, the 10 infants observed were with television 7.5 hours per week, and the 10 toddlers were with television 10.5 hours per week.

Although some infants were in the TV room for as long as two hours at a time, the majority of their viewing sessions (75%) were brief (5 minutes or less), indicating that much of their exposure may have been unintentional. Mothers, for example, frequently brought an infant with them as they completed chores. These short sessions were balanced with longer sessions, most typically 15 – 30 minutes. Children younger than one were sometimes left in the room for much longer periods (1- 2 hours at a time), but this did not necessarily reflect parental encouragement of viewing.

TABLE 1: PROGRAM CATEGORIES TO WHICH TODDLERS WERE EXPOSED

Program category	Description	Examples
Child Educational	Programs designed specifically for children and intended to be educational or informative.	Sesame Street Captain Kangaroo Mister Rogers Electric Company
Child Animated Entertainment	Cartoons designed for children and not intended to be educational or informative.	Bugs Bunny and Friends Tom and Jerry Superfriends
Child Live Entertainment	Programs for children not intended to be educational or informative that included people, although some portions of the program may have been animated.	Muppet Show Morningtown
Adult Informative	Documentaries, education, arts, religion, and informative programs not specifically designed for children.	News Presidential Inauguration Sixty Minutes
Sports	Any athletic contest or program about a sporting event.	Football Sports World Basketball
Comedy	Situation comedy series originally produced for an adult audience.	Bewitched Mash Happy Days
Drama	Dramatic programs produced for adult or general audience viewing that do not contain a significant action or comedy component.	All My Children Another World Movies (e.g., Song of Norway)
Talk/variety/game show	Game shows, entertainment-oriented talk shows, and variety entertainment programming.	Tic Tac Dough Thanksgiving Parade Joker's Wild
Action adventure	Adult programs including a substantial component of adventure, horror, violence, and suspense.	Rockford Files Incredible Hulk Movies (e.g., Tarzan Triumphs)

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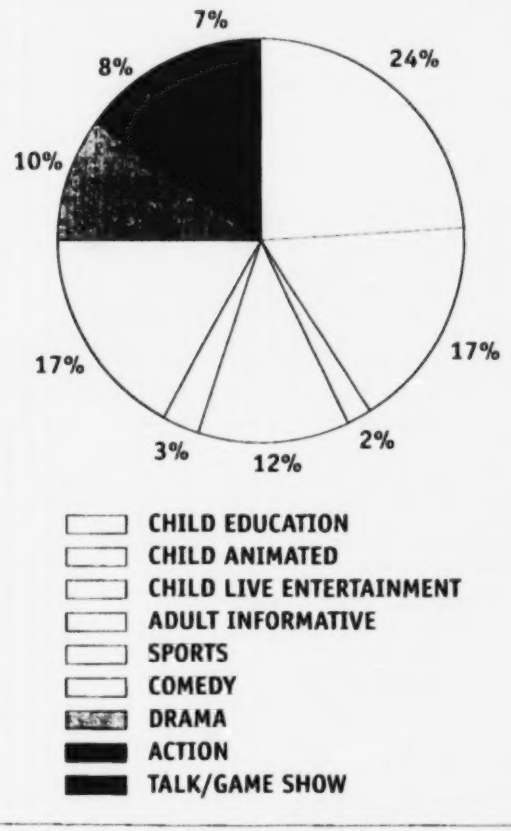
Sometimes the parent placed the baby in a location where it would be difficult to view, such as in a crib far from the set.

I was also interested in what was airing when the infants and toddlers were in the TV room. We classified the television programs into nine different program categories. Table 1 gives a description of each category and provides examples of programs that were airing.

Although the most frequent program airing when toddlers were in the room was *Sesame Street*, the second most frequent program they were exposed to was the news. Presumably this is because parents do not think their young child comprehends the content of programs not designed for them. Nevertheless, this finding highlights a potential disconnection in the way parents think about TV. It is a disconnection (attention vs. comprehension of adult content) that may be important for researchers to understand, particularly if children are exposed to salient but confusing images such as those related to the events of September 11th, for example. One study found that 3- year-olds were exposed to more news and other adult programming than were 7 year olds (Huston et al., 1999).

FIGURE 1: PERCENT OF TIME SPENT EXPOSED TO PROGRAMMING OF DIFFERENT CATEGORIES BY TODDLERS.



The toddlers in our research sample were also frequently exposed to comedies such as *Bewitched*, M*A*S*H, and *Loveboat* (likely equivalents today might be *Friends* and *ER*). These data are especially interesting considering that parents would be unlikely to report that these sorts of programs are appealing to their toddlers. For instance, in research I conducted in 1997, parents of 2- and 3-year-olds said that their children's favorite programs were *Barney*, *Sesame Street* and *Blue's Clues* (Schmitt, 1997). More recent conversations with parents indicate that *Teletubbies* and *Bear in the Big Blue House* are also popular.

Although the proportion of time infants and toddlers spent exposed to dramas, action adventures, sports, game shows, or children's live entertainment programming was relatively low, combined exposure to "adult programming" made up more than half of their time with TV (55.2%).

There was considerable variation among the ten infants in terms of the amount of time children's programming was on the set while the child was present in the room. One child was present in the viewing room with children's programming only 8.61% of the time (being exposed mostly to soap operas) whereas another child spent almost all of his time with television with children's programming (90.6%, perhaps because he was frequently left in the room to view with his 5-year-old sibling). Overall, the infant group had children's programming on a little more than half of the time (51.25%).

Given the variability in exposure to children's programming (and the lack of change with age), the ecology of the home is a more important predictor of the type of programming infants are exposed to than age of the child. Some parents appear to have schedules and attitudes that lead them to restrict their toddler's viewing of adult programming, whereas others appear to select programming based solely on what they themselves would like to watch. Thus, even though many more children's programs are available today, particularly for children who have cable access, more research is needed to determine whether very young children are actually watching these shows.

Attention to television

How does attention to TV change during the first three years of life? In the group of children we studied, the percent of time attention was paid to the television screen ranged from a minimum of 5.4 percent to a maximum of 65.8 percent. Attention to television increased with age, presumably because as children get older they are able to comprehend more of the content. On average, the infants looked at the TV one quarter of the time (26.08%) and toddlers two fifths of the time (40.62%) they were in the viewing room. Although these are significant amounts of attention, they are still lower than that of 5-year-olds (mean of 59.1%). It is also interesting to note that some 2-year-olds had high levels of attention to TV while others seemed to be "pre-viewers." It appears that somewhere between 18 and 36 months, children begin to pay moderately high levels of attention to television,

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but some children begin earlier than others.

As children get older they are also more likely to really "watch" TV (that is, devote sustained attention rather than sporadic attention to the screen). For infants younger than 12 months, "viewing" involved glances at the TV. They frequently viewed from the floor, a baby-seat, walker, or a crib.

TABLE 2: PERCENT LOOKING AT DIFFERENT TYPES OF PROGRAMMING

Programming	% Looking
Child Educational	59.0
Child Entertainment (Animation or Live Action)	65.2
Adult Informative (News or Sports)	21.5
Adult Entertainment (Drama, Game Shows, Comedy, Action)	38.7

Interestingly, they looked at the television for longer periods of time when drinking a bottle. Exceptions occurred, however. Two of the five babies seemed to have clear preferences for television programs and characters: One would momentarily stop alternative activities and look at the screen when Daffy Duck or some of the characters on *Captain Kangaroo* appeared; the other liked the distinctive voices of *Sesame Street* characters Ernie, Bert, and Grover and *The Three Stooges*.

In addition to cognitive attention, the TV set also received physical attention from the children, reflecting very young children's desire to explore and manipulate the set or feel the animals or furry characters on screen. One-year-olds were observed playing with TV knobs or touching the screen, as if they were unsure it was real, even though their parents would sometimes move them away from the set as if they were misbehaving.

By 18 months, children were less interested in physical exploration and were interested in different content than their younger counterparts. Toddlers looked at TV for longer stretches and were observed to be interested in some adult characters including Elizabeth Taylor, the *Incredible Hulk*, and the characters in *Happy Days*. Importantly, the context of what was airing influenced toddlers' attention to TV. They looked more frequently at programming that was meant for them than they did at adult informative or entertainment programs. (XX)

Table 2 illustrates that children paid much more attention to child-oriented content than adult-oriented content. Attention to child content increased with age. It is interesting that at such an early age viewers were beginning to make a distinction between content designed for them and content intended for adults.

The data from the videotapes indicate that infants and toddlers do not differentiate their attention to advertisements. They were equally likely to look at the television regardless of whether an advertisement or program was on the screen. Anecdotes and ethnographic research (Lemish, 1987) suggest that very young children would be interested in the jingles or movement found in ads; however in this study of TV viewing as it naturally occurs at home, there was no increase in attention to ads. In fact, only one infant showed greater attention to advertisements than to programs; this was an 11-month-old who was only in the viewing room for 2 hours over the 10-day period. Nevertheless, babies may be learning more about markers of such content within the home environment. They may observe that people tend to talk, leave the room, or change the channel during advertisements (Collins, 1993).

Attention to Formal Features of Television

Although there are grounds to believe that very young children have a different understanding of television than older children do (Schmitt, 1997), the features that attract their attention to TV are quite similar to those that attract older children (Schmitt, Anderson, & Collins, 1999). For example, infants' and toddlers' attention was enhanced in the presence of singing, child TV characters (especially babies), puppets or other nonhuman characters (e.g., a talking number), and movement. This suggests attention to features that are *comprehensible* to very young children, not simply those that are designed to draw attention (such as scene changes, visual complexity, and sound effects). In addition, attention was depressed in the presence of adult male TV characters, a formal feature that typically signals adult content. Thus even though TV provides complex audiovisual stimulation that communicates stories, events, and ideas, there are audio and visual features that serve to elicit, maintain, or depress attention to TV across a broad range of ages.

TABLE 3: PERCENT OF VIEWING TIME TODDLERS PARTICIPATED IN VARIOUS BEHAVIORS.

Behavior	% of Viewing Time
Looking at television	40.6
Social interaction	39.2
Playing	32.1
Eating	7.6
Reading/being read to	2.2
Grooming	1.4
Writing/drawing	1.3

Behaviors while viewing

Because young children tend to do a lot of things at once it is also important to understand what they do while also watching TV. We collected information about two- to three-year-olds' behaviors while viewing, including social interaction, playing, reading, writing, eating, grooming (e.g., getting dressed), chores (e.g., putting away toys) and physical activity (e.g., standing or moving through space).

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As can be seen in Table 3, the most frequent non-viewing behaviors were social interaction and playing. In the larger study, non-viewing behaviors of older children (age 5, 8, 12) and adults were also examined. Both of these behaviors declined with age – in other words, older children were less likely than toddlers to interact with others or play while watching TV (Woolf, Schmitt, & Anderson, 2000). (17)

It is interesting to note that two- to three-year-olds were as likely to interact with someone in their environment as they were to look at the screen (sometimes they did both at the same time). Talking was the most common type of social interaction, followed by looking at others. Two-year-olds also spent some of their viewing time sitting beside another person or cuddling, indicating that at this age at least, television viewing is not necessarily a physically isolating activity.

More than half (58.5%) of the toddlers' social interactions were with another child (usually a sibling). They were equally likely to interact with their mother or father when in the viewing room (26.2% vs. 19.2%). Interactions with non-parent adults were infrequent.

The most common types of play involved play with toys (59.4%) followed by diffuse play—for example, running around the room (15.1%). A very small amount of toddlers' playtime was spent with games, drawing, dancing, or tumbling. Although toddlers spent very little of their viewing time eating or reading, these activities became more common at older ages.

Toddlers were physically active approximately one-third of the time they were in the viewing room. This may be because some children's educational programs encourage viewers to stand up and participate, or because toddlers in general are active (e.g., they were frequently mobile in play or while following a parent or sibling when they entered or exited the room). The popular depiction of children being "mesmerized" by the screen certainly doesn't apply to the youngest viewers, who are much more active in front of the set than older children and adults.

Although it is commonly believed that television displaces time spent with others and playing, nearly half of 2 year olds' time spent viewing television was spent interacting with others and one-third of their viewing time was spent playing. Importantly, very young children's non-viewing behaviors as they watched TV varied according to program content. Consistent with children's tendency to look at the screen more during child-oriented content (Schmitt, Anderson & Collins, 1999), children participated in fewer non-viewing behaviors while watching such content. Furthermore, this is consistent with findings that children's attention is driven by their comprehension of the material (Pingree, 1986).

In addition, although the youngest viewers are not yet differentiating their attention to advertising, they do appear to be learning some of the cues to signal change in content. For example, even 2-year-olds socialized and played more during advertisements than programs. Inexplicably, they engaged in more grooming during programs than advertisements. Infants' and toddlers' attention to and behavior during ads is likely different than that of older children (who, starting at around age 7, depress their attention to advertisements), perhaps because they have not learned of their selling intent or because they are not yet looking for a narrative.

Conclusions

Although the American Academy of Pediatrics suggested that parents not allow children younger than two to watch any television, many parents may feel that this is unrealistic advice. Survey and observational data show that infants and toddlers are spending time with television. Therefore, instead of focusing on whether or not TV should be used, I will focus on the implications of our research for parents and producers of programs that children watch.

There is some indication that what parents think of as "background TV" may potentially provide learning opportunities for the developing child. Sometime between 18 and 36 months of age, children become "TV viewers" and certain formal features that attract older children's attention also attract theirs. Although toddlers' comprehension of a televised event prior to age 3 is not equivalent to their understanding of an unmediated live event (Schmitt, 1997), it appears that they are able to make sense of simple, age-appropriate content. For example, Lemish (1987) reported that some of the 2-year-olds she observed learned numbers and letters after watching *Sesame Street*. In addition, one small qualitative study with children 2 years of age and younger found that children engaged in a great deal of interaction while watching *Sesame Street* that is considered beneficial to language development; children were observed naming objects, repeating labels, and asking questions while viewing (Lemish & Rice, 1986).

These patterns in viewing have important implications for parents. Although there were large individual differences in viewing among the children in our small sample, young children were exposed to a great deal of content that is difficult to understand -- in particular, adult programming. Viewing general audience programming (such as Superman) at age two and older has been related to lower scores on tests of school readiness (Wright et al, in press; see also Truglio, Huston & Wright, 1986). It is likely that the adults whose children spend a large proportion of time with adult programming are engrossed in these programs and are not attentive to their young child's needs. If more parents were aware of possible deleterious effects on their young children, they would likely be more sensitive to what is on the screen while they are in the room.

Parents and caregivers need to be informed of the research evidence for the beneficial impact on toddlers of watching educational TV. A longitudinal study with children from low- and moderate-income families indicates that children who viewed age-appropriate educational programs between 2 and 3 years of age were better performers on subsequent tests of

reading, math, receptive vocabulary, and school readiness (Wright et al, in press). In fact, the benefits of educational shows were greater in children ages 2 to 3 than at the older ages. This is consistent with research showing that watching children's educational programming in preschool, especially *Sesame Street*, is related to better grades in high school English, math, and science (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Huston et al, 2001).

The benefits of watching educational TV may be even greater when programs are watched with a parent. Caregivers can use TV as a springboard for discussion and learning -- for example, by pointing and labeling objects that they see, asking questions, and interacting with the children under their care – much as they would when reading a picture book (see also Sesame Workshop, 2001 and Lerner, Singer, & Wartella, this issue). In fact, parents may be more likely to watch with their youngest children (Kodaira, 1990). Some programs are designed specifically for co-viewing. *Sesame Street*, for example, uses skits that "layer" the humor so they are enjoyable for adult and child audiences.

While researchers have only begun to learn about the ways babies and toddlers attend to and comprehend TV, programmers have largely ignored this age group. Although there are a few programs that have been developed specifically for one- to three-year-old viewers (e.g., *Teletubbies*, *With Mother [Japan]* and *Peekaboo [Japan]*) these are the exception rather than the rule. Some, like Linn and Poussaint (this issue) would argue that programmers should not target this age group. Nevertheless, if shows are developed it will be critical for writers and producers to understand what very young children are capable of comprehending in order to design and test programs that would best nurture their growth.

There are some lessons we have learned through our experiences with Sesame Street that may be useful. Most important may be the notion that content should be based on a carefully developed, age-appropriate curriculum, research must be conducted to determine what and how children are learning, and programming must be narrowly targeted to a specific age group. Producers should keep in mind changes in children's abilities, in particular the large increase in comprehension between 2.5 and 3 years of age (Schmitt, 1997). Segments should focus on simple content (e.g., counting with objects or singing children or puppets). In addition, production techniques such as pans and zooms should be minimal because they place additional cognitive demands upon the child (reference).

In sum, this research has important implications for the role of television in infants' lives.

Given that infants and toddlers are watching television, more studies are needed that whether and how media should be incorporated and developed to fit into their lives in meaningful ways.

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The Truth About *Teletubbies*

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"If Public Television doesn't do it, who will?"—PBS motto

Public television's pithy tag line is meant to have positive connotations: innovating, filling a void, performing a vital public service. But the slogan took on ironic overtones in 1998 when it appeared on advertisements heralding the arrival of *Teletubbies*, the first television program ever broadcast in the United States for a target audience of children as young as 12 months. The continuing presence of *Teletubbies* on PBS is unfortunate for parents, babies, and the integrity of public educational television.

Although *Teletubbies* is no longer in production, the show is contracted to be aired in reruns on PBS until 2008. The program features a huggable band of four alien toddlers who have televisions in their tummies. Their heads are topped by antennae conveniently sized to fit in a baby's grasp—kind of like plush rattles. As the teletubbies babble in a language sounding a lot like toddler talk, they frolic in a lush, fairy tale-like landscape. Under the watchful eyes of a blue-eyed, giggling baby ensconced in a glowing sun, they interact with things of great interest to young children—a butterfly, a giant ball, or a toaster. One of the program's main characters is a vacuum cleaner. The teletubbies' TV-tummies show films of real toddlers and caring adults playing games or sharing other activities.

The combination of space twaddle, endless repetition, and toddler antics gives the show a kind of fey, otherworldly aura, but it's a mistake to dismiss *Teletubbies* as a weird, frivolous bit of entertainment. The program is extremely popular among both children and parents. Executives at itsy bitsy Entertainment, distributors for *Teletubbies* in North and South America, estimate that the program reaches one billion toddlers worldwide.

Teletubbies: A Developmental History

PBS imported *Teletubbies* from the BBC, aggressively marketing the program as educational for "children as young as one." *Teletubbies* took a slot in the PBS Ready to Learn service, a block of programming created to help preschool children acquire skills that will enable them to

get ready for school. The Ready to Learn service works with day care providers to enhance the educational value of its programs. Providers are encouraged to show PBS programs to the children in their care and engage in constructive post-viewing activities related to each program.

Created by a speech pathologist and a former schoolteacher turned television producer, *Teletubbies* is supposed to, among other things, help preverbal children develop language and become comfortable with technology. Publicity materials for the program claim that it stimulates toddlers' imaginations and facilitates their motor development.

Shortly after its arrival in the United States, *Teletubbies* achieved notoriety when the Reverend Jerry Falwell insisted that Tinky Winky, the purple teletubby with a triangle-shaped antenna who frequently carries a purse, is damaging children's morals by modeling a gay lifestyle. Unfortunately, Falwell's preposterous, homophobic attack fueled the wrong controversy. In fact, the real problem with *Teletubbies* has nothing to do with its content, which is no better or worse than any other program on PBS. The real problem has to do with whether it's good for 12-month-old babies to be watching television.

When *Teletubbies* premiered on public television, its producers, distributors, and executives from PBS claimed that it was educational for children as young as 1. They made these claims *despite the fact that there was absolutely no research to show its educational value for babies.* Three years later, the show continues to run on PBS, still without evidence to support its producers' claims that the program is educational for 1-year-olds. There is no research showing that the program helps babies learn to talk. There's none to suggest that it facilitates motor development in 12-month-olds. There is no data to substantiate the claim that young children need to learn to become comfortable with technology. In fact, there is still no documented evidence that *Teletubbies* has any educational value for babies at all.

at a glance

- Claims for the educational value of *Teletubbies* for children as young as 1 have been made despite the absence of research to support such claims.
- The *Teletubbies* program and its products have generated more than $137 million for the BBC; Teletubbies dolls produce between $30 and $50 million in annual sales.
- The producers and distributors of *Teletubbies* have partnered with fast food restaurants, offering Teletubbies toys in Happy Meals while distributing exercise videos to "fight against obesity in children."

What About "the Research"?

When asked about research, people associated with *Teletubbies* respond that studies show how much children and parents like the program. But the fact that babies like something, or parents think they do, does not mean that it is educational, or even good for them. Babies are notorious for liking all sorts of things that may or may not be good for them.

Teletubbies ' producers and promoters argue that children under 2 are watching television anyway, and that it's better for them to have a program created especially for them. A host of child development experts disagree, including Dan Anderson, a professor of psychology at the University of Massachusetts, who has done extensive research on children's television. According to Anderson, it's not quite true that 1-year-olds are already watching television. Anderson states that "children under 2 don't watch television in a sustained way and current research

suggests that they may understand it differently from older children" (Linn & Poussaint, 1999, p. 21).

It may be that 1-year-olds spend time in front of the television, and may sometimes even be engaged by it. But babies are not turning it on themselves out of some inherent need. Nor are they likely to be clamoring for a favorite program. Babies, unlike older children, are not subject to peer pressure to buy into popular culture. Even if all of their day care buddies are watching the tube, 1-year-olds don't discuss programs around the juice table. In fact, the first 2 years of life are about the only time that parents can easily avoid struggles with their children about television and tie-in toy marketing.

The show continues to run on PBS, . . . without documented evidence that *Teletubbies* has any educational value for babies at all.

The reality is, as Anderson notes, "we don't know very much at all about how babies and toddlers understand television" (Linn & Poussaint, 1999, p. 21). In fact, there is very little research on babies and television at all. There is some evidence that they attend, at least intermittently, to television (Anderson, Field, Collins, Lorch, & Nathan, 1985). There is some data that they can imitate vocalizations produced on television, and that children as young as 14 months can imitate simple actions (Meltzoff, 1988). Research also suggests that children as old as 2, unlike their 3-year-old counterparts, have significant difficulty applying televised information to reality (Anderson & Levin, 1976). Conducting research about comprehension and learning with preverbal children is extremely difficult because they can't tell you what they know.

PHOTO: JANET BROWN MCCRACKEN

One-year-olds are subjected to television because their parents, day care providers, or older siblings turn it on in their presence. Before *Teletubbies*, this happened when siblings were watching, when parents were watching the news or other adult programming, or when harried parents used TV as a way of getting a break. If a baby's exposure to television were limited to one half-hour program a day, it's unlikely that the experience would be harmful. But now that 1-year-olds have a program "designed especially for them," it is likely that they will be exposed to it in addition to, not instead of, whatever they were exposed to before. And because, as PBS publicity materials state, parents trust PBS to provide age-appropriate educational programming, it is very possible that parents—who don't realize that age-appropriate television for 1-year-olds might well be an oxymoron—are now actively encouraging their youngest children to watch it.

We are only beginning to understand what television really means to the very young. What is known about how children under 2 learn and develop suggests that they should spend most of their time actively engaged in exploring the world using all of their senses. Because we don't know what, if anything, very young children gain from viewing television, and because it has been demonstrated that watching television can be habituating, it is irresponsible for the creators and promoters of *Teletubbies* to encourage parents to expose their children to it at such an early age.

Research has shown that excessive television viewing is correlated with poor school performance and childhood obesity (American Academy of Pediatrics, 1995). Not long after *Teletubbies* premiered in the United States, the

American Academy of Pediatrics, citing the importance of early brain development in the lives of children, the potential negative effects of television, and the lack of research about its impact on babies, issued a strong recommendation that children under 2 should not watch television (Zanga, 1998).

Yet the producers and distributors of *Teletubbies* continue to make elaborate claims regarding its educational value for its target audience, including babies. Although many of the program's stated educational goals sound promising, they do not stand up to close scrutiny:

> Teletubbies *offers a new generation of television viewers—the youngest and most impressionable—the opportunity to feel safe in and enjoy the ever-changing world.*—PBS

> *We're especially excited about the* Teletubbies *Web site because the television series is designed to help young children become comfortable with technology.*—Alice Cahn, then director of children's programming at PBS

> *[Children watching* Teletubbies*] . . . will feel more confident, I think, to play, and more reassured to play.*—Anne Wood, creator of *Teletubbies*

These statements are reminiscent of the manipulative advertising technique of convincing potential buyers that they have a defect which can be cured by buying a product. Each claim implies that children begin life with a deficit—a deficit that, in fact, doesn't exist. There is no evidence to show that children raised in a technological world are uncomfortable with technology. There is no evidence that children raised with what the psychoanalyst D. W. Winnicott would call "good enough parenting" do not feel safe in a changing, evolving world. Nor is there evidence that these same children do not feel confident to play. In fact, play comes naturally to children as their form of exploration and learning about the world. The capacity to play can be squelched by a child's environment, and it can be reinforced, but it does not have to be taught.

Because parents trust PBS to provide age-appropriate educational programming, it is very possible that parents—who don't realize that age-appropriate television for 1-year-olds might well be an oxymoron—are now actively encouraging their youngest children to watch it.

Babies: An "Underserved" TV Audience?

Kenn Viselman, the head of itsy bitsy Entertainment, has also declared that *Teletubbies* was designed to recognize and provide programming for an underserved audience of very young children. To say that 1-year-olds are "underserved," a term usually associated with people needing and not getting adequate health care or social services, implies that *Teletubbies* is serving a need—that babies need to watch television. He carries this almost missionary zeal to the whole arena of product licensing: "The idea of creating an extension of the viewing experience for the child is very important," he told the *Los Angeles Times* (Heffley, 1998). "When you don't put out any product at all, you're doing as great a disservice to your audience as putting too much product out into the market" (p. 1).

Viselman waxed enthusiastic about the predicted popularity of *Teletubbies* merchandise: "You're looking at a major multimillion-dollar property," he told *Time* (Collins, 1997, p. 96). Meanwhile, Cahn was quoted in the *Christian Science Monitor* (Goodale, 1998) as saying, "Merchandising was never, ever a consideration in choosing that show. Educational content was always first and foremost in our minds" (p. B1). This statement is puzzling, given *Teletubbies*' proven commercial track record in Great Britain and the lack of research about the program's educational value.

While *Teletubbies* is aimed at 1-year-olds, even younger children are "watching" it. Viselman claims that younger babies will learn from it is as well. Indeed, the *Teletubbies* marketing strategy includes newborns. On September 1, 1998, PBS Kids, itsy bitsy Entertainment, Ragdoll Productions, and Warner Home Video celebrated the release of *Teletubbies* videos by making "Teletubby Gift Packs" available to babies born on that day. Hospitals all over the country distributed the packs, including a copy of the videos, *Here Come the Teletubbies* and *Dance With the Teletubbies*, and a mini-Teletubby plush toy from Hasbro. No doubt many new parents were grateful for the gift, but are these gift packs beneficial to newborns? Or is this an example of extremely successful niche marketing aimed at the commercial exploitation of infants?

PBS-Commissioned Research on *Teletubbies*

From a marketing standpoint, PBS was, and continues to be, an ideal venue for *Teletubbies*. In a climate of apparent concern over the effect of media on children, it would be hard for a commercial station to convince American parents that their motives for producing a program for 1-year-olds were in any way altruistic. While we don't know how much funding PBS receives from *Teletubbies* merchandising, we do know that the program and its products have generated well over $137 million for the BBC. And Alan Hassenfeld, the chairman and chief executive of the Hasbro toy company, estimated last year that the dolls alone produced between $30 million to $50 million in annual sales.

After *Teletubbies* was ensconced in the Ready to Learn

programming line-up, PBS commissioned ARC Associates, a research firm in New York City, to conduct research on the program. But the study did not look at whether *Teletubbies* was fulfilling its educational goals. Instead, the study consisted of observations of how parents used *Teletubbies* in the morning, and how children responded to the show. In a conversation with ARC staff, the only concrete information they found regarding babies' responses to the program is that a significant number laughed at a particular image—the large image of a baby's face laughing inside a rising sun.

We asked the researchers at ARC to comment on the specific claims *Teletubbies*' creators and promoters make about the ways it enriches learning experiences for the younger members of its target audience. In virtually every instance, no data exist to back up the claims.

For instance, *Teletubbies* is supposed to "promote affection." Materials put out by the Ready to Learn service claim that "children are able to enjoy the *Teletubbies* while continuing to discover who they are and how their relationships work." There is no data to support the claim that babies can do this, or even how they do this, with or without *Teletubbies*.

Teletubbies is also supposed to "celebrate individuality." By watching the show, "children are taught to see that it's acceptable to be different and have separate interests from the crowd." Such a message would certainly be beneficial for older kids, but there is absolutely no evidence that 1-year-olds need to be protected from peer pressure. Nor is there any way to measure whether or not they understand that message.

Teletubbies teaches through repetition: "Children are given time to make predictions which is essential in the development of their thinking skills." At this point, there is no way to tell whether 12-month-olds are making predictions or not. Katherine Lyons, who was associate director of children's programming at PBS when *Teletubbies* was imported and who now works for itsy bitsy Entertainment, points out that parents who watch the program with their babies can use the time to verbalize predictions. But the researchers at ARC found that parents watched Teletubbies with their children only intermittently.

A recent study... at Stanford University shows that children as young as 2 make food requests based on exposure to one 30-second commercial.

Teletubbies and Commercial "Tie-Ins"

What we do know about very young children is that they are extremely vulnerable to commercial marketing. Young children tend to believe what they see and are not able to distinguish between commercials and programming. A recent study by Borzekowski and Robinson (2001) at Stanford University shows that children as young as 2 make food requests based on exposure to one 30-second commercial.

For a public television program, *Teletubbies* has been shameless in their commercial exploitation of young children. Consider their tie-in toy promotions with both McDonald's and Burger King. In 1998, Kenn Viselman made the following statement about product development for *Teletubbies*:

> *The whole purpose is to do what's right for children . . . Giving a 1-year-old who loves the televised* Teletubbies *a* Teletubbies *doll to hug and talk to is a natural extension of the educational and play value of the show . . . Making deals to sell* Teletubbies *T-shirts for teenagers,* to put *Teletubbies* in Happy Meals, *[italics added] and to arrange a "Teletubbies on Ice" tour are not, and that's why no such deals are in the works.* (Verdon, 1998, p. L02)

By 1999, *Teletubbies* were not yet in Happy Meals, but they were being given away at Burger King. By 2000, however, *Teletubbies* switched to McDonald's. According to Viselman, the change was attributed to "a desire to work with the largest fast-food chain" (Elliott, 2000, p. C16).

Given the rise of childhood obesity in the United States, it is unconscionable for any PBS children's program to partner with a fast food company. In a telephone interview, a spokesperson for itsy bitsy Entertainment expressed the opinion that it was a good thing for McDonald's to be directing parents to support good quality television programs. She went on to say that parents have to be responsible for the nutritional offerings to children, and that they could buy the Happy Meals toys without buying the food.

At a McDonald's in Brookline, Massachusetts, the action figures cur-

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rently promoted in Happy Meals cost $1.49 when they are sold separately. The meals themselves cost $2.72 cents. Since one of the biggest attractions of McDonald's to families with low incomes is that their food is inexpensive, it is naive to believe that most families would go into a McDonald's and spend an extra $1.49 for a toy they could get for "free" with a meal costing only $1.23 more.

In response to our questions about *Teletubbies*' fast food promotions, itsy bitsy Entertainment sent us a *Teletubbies* exercise video which is distributed in day care centers and nursery schools around the country. The program was originally broadcast on PBS as part of a campaign called, "Teletubbies Get Up and Go! First Annual Exercise Day." To publicize its effort, itsy bitsy Entertainment issued a press release headed, "Teletubbies Stand Up to Obesity in Kids." The release claimed that "the *Teletubbies* are taking the lead in the fight against obesity in children." Later in the release, Kenn Viselman is quoted as saying, "Children look up to the *Teletubbies*, so it is our responsibility to promote health and fitness—that starts early and may last a lifetime—through them."

Certainly the notion of an exercise video for toddlers, whose whole *raison d'etre* is movement, is ludicrous. So is the idea that one exercise video can undo the damage caused by McDonald's use of beloved children's icons to sell kids food that is not good for them. It is naive at best, and cynical at worst, for itsy bitsy Entertainment to help McDonald's and Burger King sell fast food to babies and toddlers while positioning itself at the forefront of fighting childhood obesity. The fact that PBS is supporting them in their efforts is a betrayal of everything the Public Broadcasting Service stands for.

Meanwhile *Teletubbies*' continued presence on PBS encourages parents, teachers, and day care providers to use television, videos, and even computer software with babies. Early on in their tenure on PBS, the producers of *Teletubbies* collaborated with Microsoft to develop software and interactive toys for babies that relate to the television program, using their link to PBS to encourage parents to think that it is educational for babies to use computers when there is little research to support such claims.

Conclusion

The financial success of *Teletubbies* targeting children as young as 12 months ushered in the transformation of babies into a viable market for electronic media programs. Few existed before 1997, the year the series debuted on the BBC. For harried parents, the program's educational patina justifies a questionable impulse to use televisions and computers as electronic babysitters for their youngest children. For marketers, it's a gold mine, not because of the programs themselves, but because of the profits from product spin-offs. Sales of toys, clothing, and accessories bearing images licensed from entertainment totaled about $20 billion last year. A trip through any major toy store shows that it takes increasing effort to find toys for babies and toddlers that are not linked to a media product.

It's time for health care professionals, educators ,and advocates for children to join together to stop the commercial exploitation of very young children. One way to do this is to speak out against marketing of media products for very young children. There is no evidence that they gain anything from exposure to electronic media, other than the experience of turning to a screen for stimulation and/or soothing. Children in the United States consume almost 40 hours of media per week (Roberts, 1999), most of which (including programs on public television) is laden with marketing. And there is mounting evidence that such excessive exposure may be harmful. A growing number of public health problems including obesity, eating disorders, violent and aggressive behavior, and excessive consumerism are linked to marketing through electronic media.

From their phony claims of being educational for 1-year-olds to their commercial partnership with fast food restaurants, the producers and distributors of *Teletubbies* continue to show a flagrant disregard for the well-being of very young children.

To paraphrase a favorite fairy tale, "the tubbies have no clothes."

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SYNTHESIS OF A ROUND-TABLE DISCUSSION WITH:
CLAIRE LERNER *(ZERO TO THREE)*, DOROTHY G. SINGER
(Yale University Family Television Research and Consultation Center, Department of Psychology, Yale University), & ELLEN WARTELLA
(College of Communication, University of Texas-Austin)

FACILITATORS:
AMY JORDAN *(University of Pennsylvania)* AND
EMILY FENICHEL *(ZERO TO THREE)*.

PARENT INTERVIEWS CONDUCTED BY:
ANNE ALBRIGHT *(University of Pennsylvania)*.

PHOTO: NANCIE MCFAUL

COMPUTERS, TV, AND VERY YOUNG CHILDREN:

What Impact on Development?

I think a computer is a better use of time (than TV). . . It is not just sitting in front of a TV and listening. You can actually cause a response from a computer. (Mother of a 23-month-old girl).

I think they see it (the computer) as a toy. I see it as a learning tool. We have a good mix of games which are just purely games (and) games that are teaching at the same time, whether it is dinosaurs or the alphabet. . . So I see it as a good way to sit them down and have them testing themselves and trying things out and trying to recall what they saw and find it again. (Father of two boys, ages 2½ and 4½).

I think it becomes just a normal part of their experience. And it becomes something that, it feels natural to go to it for educational purposes, for informational purposes, to have fun. . . just another option to bring other information in. (Mother of a 23-month-old boy).

If they are doing more educational stuff on the computer, I think because they are more active rather than passive learners, they are not just sitting there, they are actively trying to do something and physically involved in that. . . But I really like my kids to be playing at this age as much as they can, too—physically. (Mother of two girls, ages 20 months and 3 years).

These comments come from recent in-depth telephone conversations with 9 parents with children from 9 months to 3 years in age about how their young children use computers and TV in the home, and why parents are making the decisions they do about their children's experience with these media. The families are participating in a larger study by the Annenberg Public Policy Center at the University of Pennsylvania, and they do not represent the entire range of families in this country. However, we thought that these parents' thoughtful observations would help spark discussion among three professionals whose expertise on very young children and the media derives from a range of experiences. They are:

- Claire Lerner, Director of the Learning and Growing Together Strategic Initiative at ZERO TO THREE and the organization's primary liaison to the parenting and general press;
- Dorothy Singer, Senior Research Scientist in the Department of Psychology at Yale University and Co-director of the Yale University Family Television Research and Consultation Center. Dr. Singer co-edited *The Handbook of Children and the Media* (Sage Publications, 2000)
- Ellen Wartella, Dean of the College of Communication, Walter Cronkite Regents Chair in Communication at the University of Texas at Austin. She is co-author of *Growing up with Interactive Media* (The Markle Foundation, 2000).

In an hour-long telephone discussion, we asked Claire, Dorothy, and Ellen to respond to several questions raised by our conversations with parents.

Q: No large-scale research has been conducted on what media are available to children under three in their homes and other caregiving environments, or on how very young children use these media. But you have done some exploratory surveys and a great deal of listening to colleagues and parents. Do the comments that the parents we talked to seem consistent with your own impressions?

Dorothy: Because there is so much interest in the so-called "digital divide" between families at different income levels, you might be interested in what we have been learning in our work with low-income families. At the beginning of 2001, the Yale University Family Television Research and Consultation Center conducted a preliminary survey of 58 parents and caregivers (home care providers, Head Start teachers, center-based child care providers, and kindergarten teachers) of preschoolers (ages 2-5) from low-income families in the New Haven, Connecticut area. We found that 87 percent of the settings had VCRs; 63 percent had computers; and 30 percent had access to the Internet.

In October, we telephoned 34 low-income mothers of preschoolers, about equally divided among African Americans, Caucasians, and Latinos. Twenty of the mothers had computers in the home (although two computers were not hooked up). Children spent from 45 to 90 minutes a day at the computer. Among the mothers, 10 helped their preschoolers use the computer; 8 did not. When we asked parents why they used computers with their children at home, the most frequent response (from 10 mothers) was "help in learning," followed by "important in today's society." These responses were consistent with what parents and caregivers in the earlier survey told us was their highest priority for children in preschool—cognitive skills training. But interestingly, although parents mentioned the names of their

at a glance

Child development experts recommend:

- Screen TV programs and computer software before presenting them to a child.
- Limit young children's time with computers and TV.
- Be with the child while watching TV or at the computer.
- Extend learning from media into play at home or in the child care setting

children's favorite computer software, they didn't necessarily know much if anything about the programs' content.

Ellen: The data from New Haven about the prevalence of home computer use are different from what was found in Latino and African American homes in a low-income school district outside Austin. There the percentage of low-income homes with computers was much lower. In our study here in Austin in 2000 there were home computer differences among the low-income households, with Anglo households having the highest ownership (72%), African American households slightly less (63%), and Hispanic households the least (56%). Slightly more than half of African-American and Anglo households had Internet access; only 35% of Hispanic households did. More research is definitely needed! I agree with you about VCRs—they seem to be everywhere.

I'm interested in the comments of parents in the Annenberg survey that suggest that computers are so "interactive" and that computers as a technology are better than TV, even with all the work that's gone into educational television. What's so interactive about pointing, clicking and moving a mouse? Toddlers who are watching TV aren't "just sitting there"—children can be interactive through thinking, responding, talking back, and singing along with a TV show.

For me, the important question about TV or off-the-shelf software is: What do very young children really learn? What's the content? Is it age-appropriate?

Claire: Because parents are often using TV as a babysitter, to give themselves an often much-needed break, they may not appreciate how interactive their children may be with the TV, talking to the characters, singing along with them. When parents watch TV with their children they can extend the learning even further by applying messages from TV to the real world—for example, if parents were trying to help mediate a sibling quarrel, they could ask, "How did Oscar and Ernie work out their problem?" My general impression is that if parents value computers more highly than TV, children will pick up this attitude.

I get a lot of questions from parents who are responding to "make your baby smarter" advertising from manufacturers and to other parents who are beaming with pride about what their baby or toddler is able to do at the computer. They worry if their own child isn't interested – even at 9 or 12 months. The question reporters always ask, about computers or TV for very young children is: "Is it harmful?"

Q: Well, is it?

Claire: I think we need to put things in perspective. Being at the computer or watching children's programming on TV for 20 minutes is probably not harmful. And I don't think taking an all-or-nothing approach is useful. I wouldn't say, "No child under two in front of a screen."

"I think a computer is a better use of time (than TV)...It is not just sitting in front of a TV and listening. You can actually cause a response from a computer." (mother of a 23-month-old girl) "What's so interactive about pointing, clicking and moving a mouse?" (Child development expert)

But I do think we should do more research to learn whether children who spend a lot of time with computers are harder to engage in more traditional play and reading. We also need to take a closer look at kids who have trouble with social interaction and are drawn to videos or computers as a refuge. These are the children who may have huge tantrums if parents don't let them watch videos or use the computer for long periods, when actually what they need most is less time with the computer and more opportunities to be interacting with people.

Ellen: We also need to learn more about the physical consequences of children using new technologies at very young ages. There are no good data about what is ergonomically appropriate for young children, but pediatricians and ophthalmologists are concerned. I'm also worried if computers are being used just for "drill" with young children.

Picking up on Claire's point, I empathize with busy or stressed parents' need for a "safe media environment" for their young children for short amounts of time. For example, parents agree that public TV is a safe environment for preschoolers. Parents can screen the content of videocassettes and computer games to make sure they are at least benign – parents shouldn't have to feel guilty if their kids are in front of a screen while the parent makes dinner.

Q: What about benefits from new media. Do TV and computers help very young children learn?

Dorothy: Kids learn when parents are there with them. That's true whether we are talking about TV, computers, or make-believe, hands-on play with whatever is around the house. Unfortunately, many parents have never played with their children because their parents never played with them.

Ellen: We should definitely reinforce the idea of parents playing with their children, and play in general. Remember the mother in the Annenberg survey who said, "I really like my kids to be playing at this age."

We should also reinforce the notion of dialogue—children need to learn listening as well as talking. Interactive media are supposed to encourage dialogue. Young children need time to reflect on and process material, so TV programs like Sesame Street and Mister Rogers have reflective features as well as "cuts" and "pans" that bring attention to the screen. A "zoom" helps children reflect on what they are watching. We are finding that even young children can attend to narratives. Computer programs for young children are supposed to encourage dialogue—the child responds to changes on the screen. But parents and teachers should check individual programs to make sure that the interaction being encouraged is more than a single iteration of "I press; something happens." Building, listening – that's real interaction.

Claire: There are many reasons why a very young child might be interested in a computer – including identifying with a mom or dad who is on the computer at work or at home. But to find out what young children are actually learning from TV and computers, it's important to watch them closely, to see how they are interacting with and using what they are learning from these media, in order to know whether they are indeed enriching cognitive experiences.

In my mind, a computer is just another toy, with certain values and certain limitations. A child may get lots of practice in hand-eye coordination and refine their understanding of cause-and-effect as they click on the mouse to get their favorite character to appear. But I would argue that traditional toys, such as a shape-sorter, where the child has a "hands-on" opportunity to use their fine motor and lots of problem-solving skills to get the shapes in the correct openings, is a richer experience. Computers often do so much that they require less work on the part of the child. And the more activated the child—the more skills he has to use to make something—the more he learns.

Also, when children learn important concepts through everyday, real-life experiences, such as categorizing big and small as you compare the sizes of houses as you walk through the neighborhood, it is more meaningful and longer-lasting than learning through simulated experiences, such as on the computer. This is especially true when it comes to pretend play and the development of symbolic thinking. While there are computer games that encourage children to "make up your own story," they offer a limited number of props and characters and those characters often already have their own personality. When children play "pretend" by finding their own props—Mom's old clothes, household objects, etc.—and make up their own story, with characters they create, *they* have a much richer cognitive experience.

Just as parents can expand children's play by joining with them, parents are the ones who can extend children's learning from TV or computer games, helping them apply messages to make sense of their real world. This is rewarding for the parent and the child, but it does take time and work on the parent's part. When parents are busy and a child is willing to sit by himself or herself for 30 minutes at the computer or in front of the TV, it's hard to motivate parents to sit down with the child at the computer or extend play based around a TV show.

Dorothy: Many parents say they "don't have time" to play. But in our workshops for low-income parents, parents tell each other, "You feed your kids—that's the time to play." When parents begin to inject playfulness and imagination into daily routines—5 or 10 minutes is enough—the whole style of parenting changes. An older sibling can be a good "make believe teacher" if he or she has learned from a parent to play imaginatively.

Q: What guidance can we give parents and caregivers about the use of TV and computers with very young children?

Claire, Dorothy and Ellen: At this stage in our knowledge, four guidelines seem important.

1. ***Screen TV programs and computer software before presenting them to a child.*** What is the content? Have the producers or manufacturers tested the content for age appropriateness?
2. ***Limit young children's time with computers and TV.*** Generally, 30 minutes a day on the computer and 30 minutes of TV are reasonable for 2-3 year olds (balancing empathy for the parent with developmental appropriateness.)
3. ***Be with the child while watching TV or at the computer.*** Mediate the child's experience—that is, help the child focus; discuss what the child is seeing or making happen on the screen.
4. ***Extend learning from media into play at home or in the child care setting.*** Through discussion and pretend play, help young children use their experiences with media to make sense of their real world.

Q: What research needs to be done so that more definitive statements can be made about the impact of media use on young children's development?

Claire, Dorothy and Ellen: A research agenda in concerning young children and the media should include:

1. ***Small ethnographic studies*** to explore what very young children – especially children under two – are actually doing with media in their everyday environments; parents' and caregivers' expectations concerning media use; and the impact of media on roles and relationships within the home. This could involve both interviewing parents and caregivers as well as observing children.
2. ***Scientifically valid national surveys of families with infants and toddlers*** to determine young children's access to and use of household media. Does media access vary across families with different resources and parenting approaches? Does media use vary according to the characteristics of the child (e.g., disposition or gender)?
3. ***Content analysis of media (particularly computer software) aimed at and used by children under three.*** What cognitive and social skills are being promoted? What steps are producers of materials taking to ensure age-appropriate content? How are materials being tested?
4. ***Experimental assessment of the impact of media use on children's physical, cognitive, and social/emotional development.*** All three areas are important to explore in carefully controlled settings. In addition, both immediate and long-term effects need to be considered. ◆

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TODDLERS & COMPUTERS:

A Father's Wary Eye

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'So, Dr. Pruett, what are you and your wife going to do about Olivia and the computer?'

My medical students already knew our terrific 28 month old, having met her when she'd come with me to class to illustrate such developmental milestones as autonomous strivings and robust age-appropriate oppositionality, the latter being their favorite. The question followed my lecture on non-human environmental influences, with heavy emphasis on concern for the role of the media in the early years. The question was reasonable and I was fair game. Being of two minds on the matter, however, I was left momentarily speechless.

As for Olivia and the general media, she was already a discriminating TV watcher, watching an hour or so a day of *Sesame Street*, *Arthur*, *Thomas the Tank Engine*, or *Dragon Tales*. She asked for her favorites by name, and eschewed *Barney* and *Teletubbies*. She talked animatedly about the characters and themes, but we monitored signs of overexposure, mindful that for months she'd been in flagrant disregard of the American Academy of Pediatrics' prohibition on TV before 2 (Zanga, 1985). The Academy had a point; when Olivia watches a bit too

long, her face gets impassive, gaze too fixed, muscle tone more rigid, and she forgets to cuddle with whoever is sharing the 'snugglecouch' with her. If we reach to pull her over, she'll give a smile as if to say "Oh, yeah, a real person!" and then lean right up tight against us. On the whole, we feel we can help her manage, enjoy and benefit from this unwieldy beast. But the computer seemed another matter altogether — harder to ignore or avoid.

The Kaiser Family Foundation tells us that 62% of 2- to 7- year-olds have computers in their homes and that in 4 years that same number will be online (Roberts et al., 1999). So, Olivia's a majority stockholder, and already acts like one. For months she's wanted to scramble up whenever she found us tacking away at the "puter" checking emails, enchanted by anything that grabs our attention in such an outsized fashion. Crawling up on my lap, she was especially fond of the "fishy" screensaver, and intrigued by the relationship between the keyboard, mouse, cursor and "finger." She now can turn on the computer, load a CD-ROM, and happily manipulate the mouse. She certainly *looks* "interactive" — but then she usually does.

Don't get me wrong. I'm no Luddite in this realm. Yes, I used to write manuscripts with No. 2 pencils on blue-lined yellow legal pads, and still harbor the suspicion that the mental/physical act of writing, including my own, has become *way* too easy. The visual-neuro-digital-muscular process necessary to turn thoughts into handwriting seems a natural governor of excessive speed and recklessness on the prose highway. Now I write most everything in binary code, and it is far easier and instantly dispersible. But is it far better? And, of course, I know that the digital competence struggle between generations is mine to lose — and happily — to my children. There is no way I want Olivia to feel as (periodically) inept as I do as she prepares to navigate her digital way. But this early in her life? And is it better for her in some essential way than other human "interactive" learning or communicating experiences?

What can she really "learn" from her favorite screensaver? What intrigues her about this visually dazzling "living" display? She rubs the screen gently with one hand as the fish lazily swim across the face of the monitor, and sponges bubble. She loves feeding the goldfish at her day care and the koi in her backyard pond, but when I suggested (provocatively) that we feed *these* fish, she chuckled her get-a-life laugh: "No, Daddy - silly Daddy - fishies don't eat!" She chides me not to touch the mouse *or* the keyboard when the fish are at work, knowing either one "disappears the fishies," which disappoints and irritates her plenty. Are such virtual disappointments (disappeared fishies) distinguishable from real ones? Do they even matter in a visually captivating domain, that is likewise capable of instant communication with like-minded, if disposable, "friends"? Add fingertip creative control and calculating, investigating power unimagined by analog-raised kids, and what's *not* to learn?

So what's the problem, and why be wary? Why did several colleagues ask me to sign a moratorium on the further introduction of computers into early childhood education in 2000 (I chose not to)? Evidence for the moratorium vote to date:

- Very little is known about the effects of home or school computer use by preschoolers on social, cognitive, or physical development, a point made clear by the David and Lucille Packard Foundation Children and Computer Technology report in January 2001.
- Kids run a risk of muscle injury and repetitive strain by working at adult-sized desks, according to a Cornell ergonomics study (American Academy of Pediatrics, 1995).
- The link between obesity and heavy television viewing (American Academy of Pediatrics, 1995) may also be present with computer use given that they are both, essentially, sedentary.
- There is an association between the use of violent computer games and increased aggression in pre-disposed boys and girls.
- And social implications? In my child and adolescent psychiatry practice are always several teenagers (boys and girls) enamored of their cyber-pseudo-social lives even though they "don't intend to meet or even try to meet" any of the "friends" they spend three-fourths of their chat-room cyber life "conversing" with. As one 14-year-old said, "These people are so real, you don't want to spoil it by meeting them." The trouble comes when these are their *only* or *preferred* friends.

Are these nay-sayers just the 21st century version of Gramma Smith, tongue-lashing my parents for allowing their three little Christian boys to go watch "the devil" at the Bison Moving Picture Theater in downtown Shawnee (Oklahoma) — risking exposure to Flash Gordon, *Movietone News*, Doris Day? Need Olivia's parents look closer to see what she risks? As a developmentalist, I have certainly learned the value of redundant learning as a process. Especially when it integrates salient relationships, emotion, vision, sound, thought, reasoning, discovery,

at a glance

- The computer could positively shape the cognitive, problem-solving, and social models of the child's world—possibly.
- It is the response of other humans that makes us human, not "interactive" imagery.
- As a father, I plan to ease my child into the best uses of the computer in the context of our relationship, shared attention, and my own (limited but growing) competence.

memory, movement, eye-hand dialogue, hands-on re-enforcement, sensual encoding, active rendering of passively received information — to name a few. A computer could certainly hold its head up in this crowd, offering great promise in shaping the cognitive, problem-solving, and social models of the child's world. Possibly.

My worries as Olivia's Dad:

I am not convinced that toddlers benefit from computers as "hands-on" experience. Neurologist and author Frank Wilson (2001) notes that "from both biomechanical and physiological perspectives, [computer hands-on] tasks are trivial, limiting feedback to visual and auditory modalities... 'uncoupled' from the learning experience." (p.12)

- Despite clever programming, the child is forever the passive responder to material that is presented in an asocial, largely solitary context, especially given the seductions of high-speed, rapid-sequence retinal/acoustic bombardment. This can be particularly worrying in the absence of real-life play and social interchange eclipsed by computer time. It is the response of other humans that makes us human, not "interactive" imagery.
- The child's attention isn't just drawn to computer magic and digital stimuli, so much as it's demanded. Another caution from Wilson: "... rapidly moving electronically-generated images may be especially hazardous to young children because of the special handling they receive in the visual-motor circuitry of the higher primate brain." (Wilson, 2001, p.16).

Of course, I'd love to have Olivia enjoy the freedom, and power, that accompanies competence with the ever-shrinking machine. But I plan to hold onto the back of *this* bicycle seat for some time. Balance will not come easily, and the road ahead is far from visible.

My bottom lines:

- I'll invite Olivia up on my lap for as long as she'll let me so I can ease her into the best uses of this excellent tool in the context of our relationship, shared attention, and my (limited) competence.
- I will set limits on her computer time, and not put a computer in her bedroom for as long as I can hold out.
- I'll check out stuff with folks that know a lot more about the appropriateness of programs and games for children than I do, like the "Entertainment" Software Rating Board (www.esrb.org). Worried as I am about the effects of violent imagery on vulnerable kids, I know and will teach her that violence perpetrated by adults in places of power is far more common and lethal.
- I will keep myself in shape with media literacy "training," so I can teach Olivia about motives and marketing in the industry as a whole.

PHOTO: L.W. MCCARTY

In the end, I don't want Olivia's computer life — whatever it may be — to keep her from checking out library books, or divert her from the fact that she lives in a moral universe, and that human relationships will always be more meaningful, complex and fun than technology could ever be.

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PHOTO: C. HALPHEN

IT'S ABOUT TIME!

Computers as Assistive Technology for Infants & Toddlers with Disabilities

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In 1981, a 2-year-old girl named Leah enrolled in my preschool special education class in a northern Virginia public school. Leah has athetoid cerebral palsy. She is nonambulatory and has difficulty using her hands or speaking; had she been born 5 years earlier, she probably would have been institutionalized. Leah could—and did—laugh at jokes. Her family knew she was bright and aware. Her family, my occupational therapist colleague, and I knew that together we would have to figure out ways to help Leah interact with the world.

There was a computer in our classroom, but no software or accessories that were useful to Leah. So using DOS we wrote a program. With a cardboard box and a cushion, we adapted a keyboard so that Leah's arm could hit the cushion, which hit the space bar, which brought up a color on the computer screen and an accompanying tune. We kept working with the technology, and so did Leah. Four years later, in "regular" first grade, using a switch mounted next to her head and a scanning array we had devised, Leah typed her first totally independent message: "It's about time!"

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at a glance

- Assistive technology (AT) for infants and toddlers includes both tools and services that help a child with disabilities engage in everyday activities that promote healthy development.
- New software programs for toddlers include features that make them usable by young children with disabilities.
- Choice, control and opportunities for repetition that toddlers love in new software are helpful for children with disabilities.
- As more and more families have computers, commercially available software can be a valuable early intervention tool.

In the 20 years since I first met Leah—and especially in the last 5-7 years—personal computers, developmentally appropriate software, and the Internet have become both an assistive technology resource for infants and toddlers with disabilities and their families, and, equally important, part of the "natural environment" of early childhood in America. Two recent experiences captured the essence of this double phenomenon for me. The first was my participation on an 8-member Expert Panel that was convened to assist the authors of a report, commissioned by the U.S. Office of Special Education Programs (OSEP), to document the research base supporting the use of assistive technology for infants and toddlers with disabilities (Division of Research to Practice, OSEP, 2001). The second was a July 2001 shopping expedition to my hometown mall, followed by a weekend with my typically developing 18-month-old granddaughter, Emily, in which she tried out the software and accessories I had bought.

With a grandmother's eye, I can appreciate Emily's taste in software and applaud her rapidly increasing skill at scanning and clicking. With an educator's perspective, I can see how software and accessories that are appealing and entertaining for Emily can be important assistive technology for children with disabilities. Maybe what we have here is another example of the benefits of universal design: Curb cuts, easy-grip kitchen utensils, and inexpensive "lapware" (computer games designed for children as young as 9 months to be used while sitting in a parent's lap) improve the quality of life for everyone.

I'd like to tell you a bit more about each of these experiences—and then let Leah have the last word.

The Use of Assistive Technology with Infants and Toddlers with Disabilities

Assistive technology (AT) is defined in Part C of the Individuals with Disabilities Education Act (P. L. 105-17, 1997) as

> *any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability.*

AT can be thought of somewhat more broadly as including both tools and services that help an infant or toddler with disabilities engage in everyday activities that promote healthy development. AT provides opportunities for young children to learn, explore and play; its use limits the extent to which their disabilities constrain their lives (Division of Research to Practice, OSEP, 2001).

Because evidence of the effectiveness of AT for infants and toddlers with disabilities or at risk of disability is for the most part anecdotal, the U.S. Office of Special Education Programs commissioned a synthesis report to document the research base supporting the use of AT for children from birth through age 2. The report was prepared by staff of the early intervention Let's Play! Project at the University of Buffalo, the State University of New York and the American Institutes for Research (AIR). The 8-member Expert Panel that assisted the authors included researchers, service providers, family members of children with disabilities, and one policy maker.

The report, *Synthesis on the Use of Assistive Technology with Infants and Toddlers*, published in February 2001, recognizes that early intervention strategies must be family-focused and family-centered; it also reflects current emphasis on "natural environments"—that is, "settings that are natural or normal for an eligible child's age peers who have no disabilities," including "the home and community settings in which children without disabilities participate" (Federal Register, 9/5/?000, cited in OSEP, 2001). The report notes that the current limited use of assistive technology with infants and toddlers may be partly due to the mistaken idea that AT is primarily a "high-tech" approach more appropriate for older children. In fact, the continuum of AT supports should include both easily available ("general") and specially designed ("targeted") options. AT for very young children with disabilities must be child- and family-responsive, should require minimal training for its use, be readily available, and should expose infants and toddlers with disabilities to natural learning opportunities that are as numerous and varied as those that typically developing children encounter.

The Report outlines three primary ways in which infants and toddlers take part in daily activities: 1) through movement; 2) through communication; and 3) through interaction with materials. The Report then looks at five daily events that are common for very young children and their families—waking and bed time, bath time, meal time, story time, and play time—and describes common materials, general and targeted assistive technologies, and caregiving strategies that facilitate a child's movement, communication, and interaction with materials, in connection with each event.

At story time, for example, very young children communicate about which book or story they would like to hear and when to start and end. They fill in words in familiar stories, and talk about things and ideas the story suggests. Infants and toddlers interact with materials as they pick out a book, hold it, turn pages, and point to pictures. For a child with a disability,

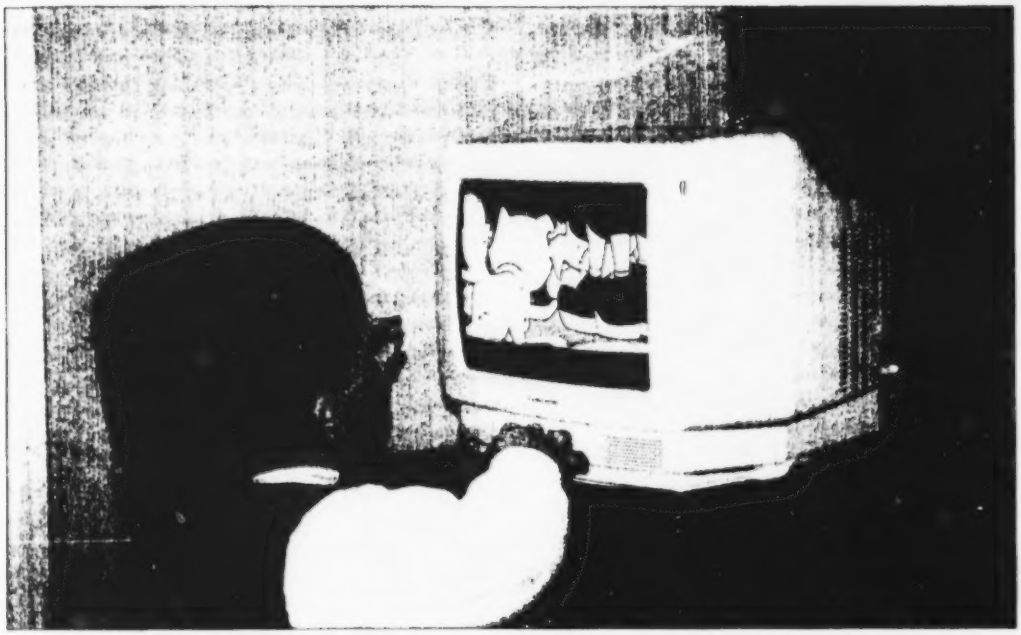

PHOTO: C. HALPHEN

software storybooks allow the child to use a single key to "turn the page" and hear a story; touch screens allow a child to get the same result simply by touching the monitor; and a computer keyboard with an Alternative/Augmentative Communication device allows a child to tell his or her own story.

At playtime, many young children with disabilities miss out. Parents and other caregivers of infants and toddlers with disabilities may be so focused on using every opportunity to "work" with the child that they forget the pleasure—and developmental importance—of play for its own sake. The limited research on play among infants and toddlers with disabilities suggest, among other findings, that their play is more solitary, sedentary, and passive than that of typically developing children. Some researchers have talked about "play deprivation" among children with disabilities that negatively affects their development of physical, cognitive, communication and social skills (Lindquist, Mack, & Parham, 1982; Missiuna & Pollock, 1991, cited in OSEP, 2001). Specialized computer software, large trackballs, touch windows, alternative customizable keyboards, and authoring software for overlays are AT supports that can help infants and toddlers with disabilities communicate and interact with materials during playtime. The story of Sammy, derived from the work of the Let's Play! Project and included in the Report, illustrates how a combination of low- and high-tech AT can allow a child to participate fully in group play.

The features of inexpensive commercially available software are well suited to the special needs of children with disabilities. It offers levels of choice and control, nothing is timed, and there is lots of repetition.

Sammy began to attend a community child care center shortly after his second birthday. Although he could talk, a neurological disorder made both large and small muscle control difficult for him. To help Sammy participate in "free play" building and car activities with his classmates, teachers added foam and magnetic blocks that were easier for Sammy to manipulate and build with to an accessible table area. With a switch-adapted battery-operated car, Sammy could knock down the towers of blocks he built as effectively as his friends knocked down their towers with ordinary toy cars. (Sammy let his friends take turns knocking down blocks with the switch-operated car). Finally, Sammy began to use a customized overlay on an IntelliKeys keyboard to control a computer software program that simulated block building. This gave Sammy the opportunity to design more intricate structures and print out the plans, which his teacher then used to help Sammy and his classmates build the structure out of "real" blocks.

The Report's findings suggest the need for more research, training, and dissemination of information on assistive technology for infants and toddlers in the context of natural environments. A number of methodological issues—for example, how to reliably collect evaluation data on the results of AT use within the family home or other natural environments—need to be considered and resolved. Both family and community caregivers and early intervention profession-

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als need training on the use of "general" and "targeted" AT with infants and toddlers in their daily activities and natural environments.

Scan, Click, and Repeat: An 18-Month-Old at the Computer

Half a dozen years ago, software for children was all about "drill and practice" (for example, "find the letter 'A'"), even for babies. But educators (or possibly customers) seem to be having an influence on software developers. When I went shopping for software for my 18-month-old granddaughter to try, I found that new programs are designed to give children control and choice. (Of course, what a toddler often chooses is to hear the same song or story over and over again, but more about that later.) In addition, program and accessory developers have figured out that it's hard for an 18-month-old to move a mouse and make a connection with what then happens on the monitor screen. So manufacturers are now putting scanning features into all their programs for children—features that my colleagues and I used to add, laboriously, to the programs we were adapting for children with disabilities.

With a scanning feature, a software program's menu or other choices appear on the screen, with choices highlighted at intervals. When you see what you want, you click the mouse. Scanning actually involves five different skills: 1) surveying all the options (on the keyboard or the menu on the monitor; 2) making a decision about what you want; 3) initiating the scanner with some motor movement (typically of the hand, but a tongue or eyelash can serve); 4) waiting until the highlighting device reaches the option you want; and 5) hitting or clicking to make your decision known. Eighteen-month-old Emily didn't pick scanning up right away. We had to talk her through the process several times. For a child with a disability, mastery of scanning can be a critical pathway to learning and communication.

Choice and control are important issues for toddlers. I am impressed that the newer software for young children offers two levels of choice and control. Software labeled as designed for babies and toddlers tends to be child-directed. Whatever a child hits or clicks makes something happen—a horse or a pig appears on the screen, a rabbit does a finger play, something moves, something talks or sings. Nothing is timed. Programs offer familiar visual images, lots of music, and the repetition that toddlers love. These features of inexpensive commercially available software are, as it happens, well suited to the special needs of children with disabilities. Speech/language therapists tell us that typically developing young children need to hear a word about 100 times before they truly understand what it means; in general, children with various disabilities need about 1000 repetitions of a word (spoken or written) to achieve the same result. Even the most devoted human caregiver wearies of such work; the computer doesn't mind a bit how often it has to repeat. A second level of choice and control offered by some software allows for growth. At this level, the computer generates prompts for the child – asking her to find the horse, for example. The child needs to know how to move the mouse in order to respond, but software designers help by making outsized cursors, such as a large star instead of the standard arrow. With some programs, the parent or teacher can customize a game or activity for a particular child, turning the scanning feature off and on, and picking different levels of challenge.

Software and Web-based support that allow parents to personalize programs with their own voices and family pictures are appealing for typically developing young children and even more important for some children with significant disabilities. It is the concrete and familiar that captures these children's attention: They need to see a picture of *their* mommy and hear her voice; a mommy bear means nothing. Some manufacturers of "authoring" (design-your-own program) software have established activity exchange Web sites; often the company offers a free piece of software in exchange for permission to post a program that uses its software on its site.

Implications for Early Intervention

Growing interest among policy makers in assistive technology for infants and toddlers, coupled with the enormous growth in commercially available computer devices and software for very young children, suggests some important implications for early intervention practice. I can imagine two complementary trends:

- **Software in the toy bag**—As more and more families have computers, early interventionists should include developmentally appropriate software among the toys and learning materials they bring to the attention of families. The software can be checked out to the family to be used in combination with the toys and manipulatives that early interventionists typically bring to share with families. Home visitors with AT expertise can give families information about how to evaluate commercially available software and help them use/adapt toys that they already own. Such no-tech or low-tech strategies as adding textured materials to the illustrations in a picture book or tabs to make page turning easier can help make the written word accessible to all children.
- **The "electronic home visitor"**—As parents observe their child at the computer, they can learn to use software not as an "electronic babysitter" but as an electronic home visitor—an infinitely patient and responsive companion who knows just how to capture and keep a child's interest, but who also reflects the family's values, cultural traditions, and unique preferences in everything from nursery rhymes to barnyard animals.

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Of course, I can also see many areas for improvement in commercially available software that would make it even more useful for certain children with disabilities. For example, I would like to see words appear on the screen in some programs that now simply offer, say, a horse neighing or a chicken clucking. I'm not trying to push early reading for typically developing babies and toddlers, but most children with disabilities need to see words sooner than others in order to make the connection among print, pictures, and sound. Those children within the autism spectrum disorder who are "hyperlexic" need to see picture and word simultaneously or they don't understand what they are reading. In brief, there is great potential for growth.

Back to Leah

After kindergarten, Leah went on to get straight A's all through grade school and high school. To use the computer, she first used her nose (there was no such thing as a mouse or trackball then). In middle school and high school, Leah used a combination of switches. Now in college, Leah is an English major with a concentration in Folklore, Myth and Literature; she uses a mouthstick, attached to the side of her computer, which she can operate entirely independently. To communicate in person, Leah prefers typing out her side of the conversation to using an artificial-sounding communication system. To speed things up, she uses a program that allows her to quickly insert frequently used phrases (including insults) into her text. It is important to remember that an individual with disabilities typically needs a range of high-tech and low-tech technology. A computer can crash in the middle of a test, so a human assistant should be available. Using a mouthstick for long periods of time is fatiguing; a back-up technology is needed. Leah became adept at e-mail much sooner than I did, and we are in touch with each other often.

Leah has written poetry for some years. I have always been impressed with her ability to put into words what is in her brilliant mind. Several years ago, she emailed me this poem about her dreams. She gave me permission to share this poem with the readers of this article.

REFERENCES

Division of Research to Practice, Office of Special Education Programs. (February 16, 2001). *Synthesis on the use of assistive technology with infants and toddlers (birth through age two)*. Washington, DC: U.S. Department of Education.

The Reality of Dreams

A disabled female in society,
not combined with ease,
she struggles with the unnerving, daily confrontation.
Difficult is the confrontation
yet handled, how
she wishes she could go back,
back to the safe world,
back to the warm, welcome arms of her Dreams.

The day is filled with terror and turmoil
she alone must face.
Dependent on people for assistance,
she fights society for not tolerance but acceptance.
Faced with obstacles, worries about tomorrow's heartaches,
life is difficult and discouraging.
Her brain and heart disagree on how to cope,
for one is full of rules and the other full of Hope.
Bogged down, her brain plays music
to encourage her heart.
Although she is quiet throughout the day,
she has much to say.
Within her writings, she lives,
she identifies.
A misunderstood character, a fantasy island,
she converses, brings them life.
Even though people treat her like something, not someone
she abhors feeling like she has to fit in.
As bedtime gets near,
those dreadful feelings disappear.

In Dreams,
she walks, she runs.
Success is her.
Living for today, no worries about tomorrow.
Let tomorrow be.
Society accepts her.
Not pretending to be someone else,
she converses freely with strangers.
Her heart and brain agree
for both are full of hope.
With strangers, she lives and identifies.
Life is full of happiness and joy,
not a harsh word is there to be heard.
How she wishes she could stay,
she knows she cannot.
It is time to awaken and face the World,
Her Dream-society is mere hours away.

Leah Cohenour, 1998

Pediatric Disorders of Regulation in Affect and Behavior: A Therapist's Guide to Assessment and Treatment

(2000) Georgia DeGangi (Academic Press, 525 B Street, Suite 1900, San Diego, California 92101-4495, http://www.academicpress.com) $49.95.

A clinician and researcher with knowledge of occupational therapy and clinical and developmental psychology, Georgia DeGangi describes both normal and atypical self-regulation in infants and children, and goes on to discuss assessment and treatment of children's regulatory problems, irritability and other mood-regulation problems, sleep and separation difficulties, feeding disorders, attentional problems, and sensory-processing problems. Each chapter provides an overview of core developmental processes, guidelines for assessment, the theory and practice of treatment approaches, and relevant case examples. The chapter on therapeutic process includes an extensive discussion of child-centered activity (CCA), an approach that focuses on improving the developmental capacities of the child within the context of the parent-child relationship. Appendices include DeGangi and Poisson's Infant-Toddler Symptom Checklist and Greenspan and DeGangi's Functional Emotional Assessment Scale, which assesses both caregiver and child behaviors.

Bambini: The Italian Approach to Infant/Toddler Care

(2001) Lella Gandini and Carolyn Pope Edwards, Editors (Teachers College Press, 1234 Amsterdam Avenue, New York, NY 10027) $21.95.

This book describes Italian experiences during the past 30 years in providing city-run early care and education for children under three in Milan, Parma, Reggio Emilia, and Pistoia—cities diverse in size, region, history, cultural traditions, and problems faced. Sections of the book present the context of caregiving (history, culture, family, and politics); the programmatic visions and experiences of leading educators in the four cities; strategies and practices used in programs; and reflections by participant-observers and research collaborators. ZERO TO THREE Board members Robert Emde and J. Ronald Lally describe the relevance of the Italian approach to infant/toddler care and Early Head Start programs in the United States.

Who Speaks for America's Children? The Role of Child Advocates in Public Policy

(2001) Carol J. De Vita and Rachel Mosher-Williams, Editors (Urban Institute Press, 2100 M Street, NW, Washington, DC 20036, pubs@ui.urban.org) $26.50.

The editors of this volume estimate that there is one nonprofit service provider and child advocacy organization for every 1,300 children in the United States (more than 45,000 total), but their impact is diminished by lack of consensus on key issues, the difficulty of mobilizing parents, an under-representation of attention to low-income children and families, and continual tension between securing funds for universal programs versus programs for children. Ten contributors, in addition to the editors, examine a range of topics, including the role of philanthropy in supporting child advocacy organizations.

The editors note that child advocates must take their case to the states and numerous localities as well as to federal policy makers, and that approaches will need to vary from state to state.

The Grandfather Thing

(2001) Saul Turteltaub (Tallfellow Press, Inc., 1180 S. Beverly Drive, Los Angeles, CA 90035). $16.95.

Saul Turteltaub is a humorist, comedy writer (*The Carol Burnett Show* and *That Was The Week That Was*), talk show host, and grandfather to Max. This volume, addressed specifically to grandfathers, chronicles the first year of the relationship between Saul and Max through reflections from Saul and observations and poems purported to be by Max. Typical comment from Saul: "Fortunately, no one expects grandfathers to do any of the dirty work, so don't screw it up for the next guy." From Max's Eighth Poem: "So come up with an answer/ I don't want to be a creep./ You found a way to have me/ Find a way to make me sleep."

Small Victories: Conversations about Prematurity, Disability, Vision Loss, and Success

(2000) Mary Lou Dickerson (AFB Press, American Foundation for the Blind, 11 Penn Plaza, Suite 300, New York NY 10001). $24.95.

Mary Lou Dickerson, a member of the Washington State House of Representatives who lives in Seattle, is the mother of a daughter born prematurely. Born prematurely herself in 1946, Dickerson is visually impaired as a result. From interviews with adults who were born prematurely 30, 40, and 50 years ago (presented as first-person accounts) and with parents of premature infants born in the past several years, Dickerson extracts several recommendations for parents of premature infants: 1) Don't be overly protective; 2) Recognize the importance of positive parental messages and expectations; 3) Find support from other parents of preemies; 4) Look for well-designed and appropriately staffed inclusive care and education programs; 5) Look for role models among successful adults with disabilities; and 5) Be an advocate for your child.

Mister Rogers' Neighborhood Child Care Video Library.

Produced by and available from Family Communications, Inc., 4802 Fifth Ave., Pittsburgh, PA 15213. Tel: 412-687-2990. Fax: 412-687-1226. www.misterrogers.org. 30 min. each. $20 each program, $100 for the six-tape series.

These programs from the Mister Rogers' Neighborhood Child Care Partnership are designed to help child care providers enhance their work with the children and families whose lives they touch. Each 30-min program includes a 12-page *Guide for Providers and Teachers*. The guides include a letter from Fred Rogers, notes on the child development themes of the program, discussions, and activities to follow viewing. The six programs are 1) *What Do You Do with the Mad that You Feel?* 2) *When Friends Fight*; 3) *When Dinosaurs Seem Real*; 4) *Hellos and Good-byes*; 5) *Going to the Doctor*; and 6) *Caring for the Environment*.

GONE TOO FAR?
Kids Talk About TV.

Produced by Sam Kauffmann. Available from Child Development Media, Inc., 5632 Van Nuys Blvd, Suite 286, Van Nuys, CA 91401. Tel: 800-405-8942. Fax 818-994-0153. 30 min. $90 plus shipping and handling.

In this video, designed to inform discussion about appropriate television viewing for children of all ages, 13 children, ranging in age from 6 to 17, talk about the impact of television on their lives. Clips from television shows and videos are included to illustrate points raised by the children. The children talk about, among other topics, the number of hours spent watching television, the content of movies, shows, and series on TV, and the influence television has on their choices and lifestyles.

Show 'N' Tell Stories, Series I, II, and III.

Produced by Jill Ellis and the Center for Education of the Infant Deaf, Berkeley, CA. Available from Child Development Media, Inc., 5632 Van Nuys Blvd, Suite 286, Van Nuys, CA 91401. Tel: 800-405-8942. Fax: 818-994-0153. Series I: 21 min. $40 plus shipping and handling. Series II: 27 min. $50 plus shipping and handling. Series III: 25 min. $50 plus shipping and handling.

These tapes are designed to teach parents and professionals to read to young hearing-impaired children and develop vocabulary, sign language fluency, and appreciation for both Signing Exact English and American Sign Language. Series I stresses the importance of early communication and reading with young deaf children. Series II tells the famous children's stories The Very Hungry Caterpillar and Good Night Moon in Signing Exact English, accompanied by animation. After each story viewers can "practice" new vocabulary and the ABCs. Series III presents well-known nursery rhymes and fingerplays with Signing Exact English and accompanying animation.

Supporting a Comprehensive Technology System: Roles of an On-Site Technology Team.

Produced by the Center for Best Practices in Early Childhood Education (formally Macomb Projects). Available from Child Development Media, Inc., 5632 Van Nuys Blvd, Suite 286, Van Nuys, CA 91401. Tel: 800-405-8942. Fax: 818-994-0153. 30 min. $50 plus shipping and handling.

This video reviews the Early Childhood Comprehensive Technology System (ECCTS), a collaborative research project carried out between Just Kids Early Childhood Center in Middle Island, NY, and Macomb Projects at Western Illinois University. Results of the ECCTS study support the results of earlier studies which suggest that innovations in technology such as computers, switches, adapted keyboards, and other assistive devices can "level the playing field" for young children with disabilities and provide access to activities in the general early childhood curriculum. The video notes that while access to appropriate equipment and software is important, these tools do not in themselves accomplish miracles. The video illustrates successful technology implementation with teachers, therapists, and support staff receiving ongoing training, technical support, and consultation from on-site technology support team.

Tech for Tots: Assistive Technology for Infants & Young Children, Level 1.

(2000) Developed by the University Affiliated Project at Childrens Hospital, Los Angeles. Available from Program Development Associates, P.O. Box 2038, Syracuse, NY 13220. Tel. 800-543-2119. Fax: 315-452-0710. www.pdassoc.com. Purchase $169.99 plus shipping and handling. Includes 16 min. video, course book, assistive technology resource guide and a PowerPoint file on CD.

Tech for Tots presents assistive technology (AT) for children ages birth through 5 from a neurodevelopmental perspective. The 1-4 hour training kit is designed for professionals, students, and parents. The topics include the purpose of AT, legal requirements for AT, functional applications/uses of AT, various types of AT available, the pivotal role of parents, and the transdisciplinary nature of AT applications.

"Is My Baby OK?" Audiotapes for Parents.

Developed by and available from Cedars Sinai Medical Center: The

Early Childhood Center, 8730 Alden Drive, Room #105, Los Angeles, CA 90048. Single cassettes are $9.95 each; the entire series is $97.95. Shipping and handling, $1.50. Call (310) 423-3500 to listen to tapes free of charge.

The Early Childhood Center is a program of the Department of Psychiatry and Mental Health at Cedars-Sinai Medical Center, Los Angeles, which offers a range of preschool and infant parenting services including parent/child groups, family consultations and treatment, and a free telephone consultation service. The "Is My Baby OK?" audiotapes are designed to help parents understand their infants' and toddlers' behavior. They cover sleep disruptions, toilet training, temper tantrums, problem eaters, the new baby, the security blanket, mastering everyday separation experiences, biting, head banging/rocking, preparing your child for the hospital, and how to choose a pediatrician. Tapes on sibling rivalry, temper tantrums, biting, and separation are available in Spanish.

On-Line Resources

Center for Media Education

www.cme.org/children

The Center for Media Education is a national nonprofit organization dedicated to creating a quality electronic media culture for children and youth, their families and the community. CME describes one of its main objectives as analyzing the emergence of online advertising targeted to children. The "Children and the Media" section of CME's Web site offers an opportunity to subscribe to CME's electronic newsletter, a description of its research initiative, articles, press releases, and book chapters.

Entertainment Software Rating Board (ESRB)

www.esrb.org

The ESRB is an independent, self-regulatory entity, established in 1994, that serves the interactive entertainment software industry by rating software titles, Web sites, and online games, and by reviewing advertising created by the interactive entertainment industry. The site's Parents Guide describes ESRB's rating system. For example, the "Early Childhood" category refers to "content suitable for children 3 and older."

KIDSNET

www.kidsnet.org

KIDSNET promotes the quality and quantity of children's electronic media. They are the only national non-profit computerized clearinghouse devoted to children's television, radio, audio, and video programming. KIDSNET produces two publications available online: Media Guide, a guide describing children's television, radio, audio and video programming, and Media News, a resource containing such issues as events, research, and technology. KIDSNET also produces and distributes online study guides for various curriculum areas and conducts television viewing skills workshops for parents and educators.

Mediascope

www.igc.apc.org/mediascope

This national public policy organization promotes constructive depiction of health and social issues in the media, particularly as they relate to children and adolescents. This site outlines Mediascope programs, initiatives, and research. The online library offers a clearinghouse of media-related issues internationally as well as links to other resources. Publications developed by Mediascope are also available, including ***Building Blocks*** by Laurie Trotta, which offers information to program developers about how children understand and process television as well as educational subject areas that may be incorporated into programming.

National Institute on Media and the Family

www.mediafamily.org

The Institute is committed to maximizing the benefits and minimizing the harm of media to children, families and communities through education, research, and information. The Web site offers a number of research-based, media education tools and resources including a content-based rating system that evaluates video and computer games, movies and television programs; a Monthly Activity and Quiz; and media Fact Sheets.

American Institutes for Research: Synthesis on the Use of Assistive Technology with Infants and Toddlers (Birth through Age Two)

www.air.org/techideas/reports.html

This report, prepared for the U.S. Office of Special Education Programs by Susan Mistrett (SUNY at Buffalo) and staff at the American Institutes for Research, deals with early intervention programs and the use of assistive technology (AT) with infants and toddlers with a disability and those at risk of developing a disability. (See Wilds, this issue). The report is available to download as a pdf file.

The Future of Children

www.futureofchildren.org

The Web site of *The Future of Children*, a publication of The David and Lucile Packard Foundation, now includes expanded and simplified access to journal issues (including the September 2001 *Caring for Infants and Toddlers*), a site-wide search tool,

and an e-mail newsletter. A section of the site provides information on resources for helping children cope with disaster; an on-line conversation feature offers discussion of the Family and Medical Leave Act.

Center for Early Education and Development (CEED)
www.education.umn.edu/cee

The Center for Early Education and Development (CEED) provides information regarding young children (birth to age 8), including children with special needs, in the areas of education, child care, child development, and family education.

This Web site contains information about CEED activities, including research, training, and publications geared toward improving professional practices, supporting parents, and informing policy development. A number of publications on infant mental health are offered on the site, including the Spring 2001 issue of CEED's newsletter, *Early Report*, which focuses on preventing and treating challenging behavior in young children.

Developmental Milestones

As part of a $10 million National Child Traumatic Stress Initiative, the federal Substance Abuse Mental Health Services Administration (SAMHSA) has awarded $581, 825 to the **Early Trauma Treatment Network, University of California-San Francisco**, a collaboration between UCSF, Louisiana State University Health Sciences Center, Tulane University Medical Center and Boston Medical Center. ZERO TO THREE Board member **Alicia Lieberman** is Principal Investigator; ZERO TO THREE Board member **Joy D. Osofsky** of LSU, Graduate Fellow **Charles Zeanah** of Tulane, and frequent contributor to *Zero to Three* **Betsy McAlister Groves** of the Child Witness to Violence Project at Boston Medical Center will be collaborating in the project. The Early Trauma Treatment Network (ETTN) will implement, evaluate, and improve a manualized treatment method called child-parent psychotherapy for an ethnically/culturally diverse group of children, aged birth to six, who have been traumatized by interpersonal violence and sudden loss. The ETTN will expand the uniform use of the child-parent psychotherapy manual at all four sites to children aged birth to six witnessing or experiencing interpersonal violence or life threat and traumatic loss, including children in foster care. It will evaluate the effectiveness of the treatment for children with different levels and specific types of exposure to interpersonal violence and traumatic loss, and for traumatized children from different ethnic and socioeconomic backgrounds. For information, contact Alicia Lieberman, e-mail: alicial@itsa.ucsf.edu.

The Robert Wood Johnson Foundation, the nation's largest philanthropy devoted exclusively to health and health care, will provide $20 million over five years to fund the first phase of a new program, *Children's Futures*, to improve the health and safety of families and children in Trenton, New Jersey. Success during the initial phase will make *Children's Futures* eligible for a second phase of 7 years, 2006-2013. In addition, the **City of Trenton** has been awarded $3.3 million in federal funding to work with *Children's Futures* on strengthening early childhood development in Trenton. Children's Futures director is **Rush Russell**, Senior Fellow at the Watson Institute at Thomas Edison State College. *Children's Futures* will fund projects that seek to improve the health of young children in Trenton by:

- improving birth outcomes and access to health care;
- promoting effective parenting skills and practices;
- enhancing the quality of child care; and
- strengthening leadership capacity in child health issues.

For information, contact Rush Russell, e-mail: rrussell@tesc.edu.

ZERO TO THREE Graduate Fellow **Kathryn Taaffe McLearn** will leave her position as Assistant Vice President of **The Commonwealth Fund** as of December 31, 2001 to become Senior Fellow and Visiting Scholar at **Columbia University National Center for Children in Poverty** at the **Mailman School of Public Health**. During her seven years with The Commonwealth Fund, McLearn played a central role in the development and implementation of the Healthy Steps program and partnership; in her new role, she will be more actively involved in the evaluation of the Healthy Steps Program, using research to inform practice and policy about the efficacy of a health-based early intervention program to promote child health and development for low-income and vulnerable children and families.

The Child Care Bureau in the U.S. Department of Health and Human Services (Administration for Children, Youth and Families) has awarded a second year continuation grant of $200,000 to **ZERO TO THREE** for a research study on *Quality Care for Low-Income Infants and Toddlers: A Study of Community Strategies*. **Mathematica Policy Research** is partnering with ZERO TO THREE to conduct this study. **Ewing Marion Kauffman Foundation** has awarded a grant of $50,000 towards a federal match for the study. These additional funds will enable

ZERO TO THREE to collect more in-depth information and to disseminate lessons learned from promising community strategies implemented in Kansas and Missouri.

The Pritzker Cousins Family Foundation has awarded a grant of $60,000 to help strengthen and expand **ZERO TO THREE's publications capacity**. Joint funding with the **Atlas Family Foundation** for this effort will enable the organization to assess and strengthen its materials, adapt them for a variety of audiences, and market and disseminate efficiently and broadly.

Training Opportunities

The Infant and Parent Development and Early Intervention Program at Bank Street College of Education in New York City is accepting applications for its new Dual Certification (General Education and Special Education Certification from New York State). It is a 60-credit course of study offering an in-depth examination of early development and infant mental health in the context of family, community and culture. Students develop skills working with infants and toddlers, assessing their developmental needs and practicing reflective, supportive interactions (including supervision) with others involved in the care and developmental guidance of very young children and families. A 41-credit non-certification and a Dual Degree program with Hunter School of Social Work continue to be offered. A limited number of Straus Scholarships will be available to support the selected graduate students for a significant percentage of their entire course of study. Contact gradcourses@bnkstreet.edu to receive printed materials on one of these courses of study, or Virginia Casper, vcasper@bnkst.edu with specific questions.

The **Infant Mental Health Clinical Fellow Program** at the **Boston Institute for Psychotherapy** offers 2-year training fellowships in infant psychodynamic psychotherapy to experienced professionals who wish to broaden their theoretical knowledge and develop therapeutic skills specific to work with infants and families. The program includes yearlong courses, supervision, case discussion, grand rounds, and clinical placements. Co-directors are Sarah A. Birss, MD (a ZERO TO THREE Graduate Fellow) and Ann Epstein, MD. Contact Sarah A. Birss, Boston Institute for Psychotherapy, 1415 Beacon Street, Brookline, MA 02446, tel: (617) 566-2200; fax: (617) 278-0200; e-mail: sbirss4@cs.com.

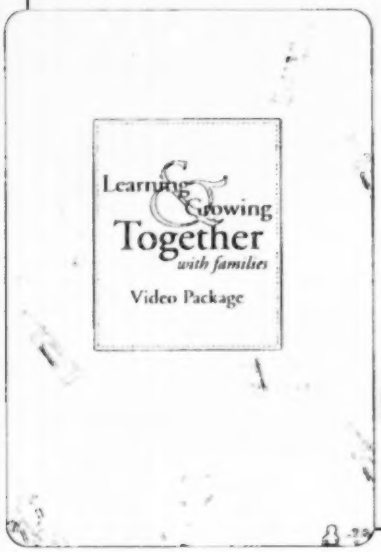
Erikson Institute and **Loyola University Chicago** are offering a new dual degree program, the Master of Science in Child Development and Master of Clinical Social Work. The program combines theoretical, clinical, and practical training, and prepares graduates to provide clinical services to children and families in child mental health, school, child welfare, child development, pediatric/medical, and early intervention settings. The program consists of three years of course work, including two internships. During the first academic year, the primary curricular focus is child development. The second year of studies includes child development and social work courses together with a two-semester internship with young children and their families. In the final year, students complete the social work course requirements and a second internship in social work. Additionally, students will have the option to add a specialization in infant mental health to their degrees. Separate application must be made to both Erikson Institute (www.erikson.edu or info@erikson.edu) and Loyola University Chicago School of Social Work (www.luc.edu/schools/socialwork or MSWLUC1@luc.edu).

The **School of Infant Mental Health** offers training in London, UK and Denver, Colorado. A course of study leading to a Diploma in Infant Mental Health includes a foundation course, infant observation and clinical seminars for two years, and seminars in infant research and infant psychiatry. A Diploma in Parent-Infant Psychotherapy is based on psychoanalytic and other theoretical and therapeutic approaches. The Readiness Programme is designed for home visitors. The Early Series, offered in London only, includes 20 short courses. Contact UK Headquarters at 27 Frognal, Hampstead, London, NW3 6AR, UK;e-mail: SIMH2000@aol.com. In the US, contact Sarah Lincoln, 4900 E. Kentucky Ave, #100, Denver, CO 80246; e-mail: sarahlinco@aol.com. www. infantmentalhealth.com.

York University in Toronto, Ontario, Canada is offering a **Certificate in Infant Mental Health**, co-sponsored by the Infant Mental Health Promotion Project, Hospital for Sick Children, and the Ontario Association for Infant Development. The program consists of 7 courses that include theoretical concepts, current research, experiential exercises, video vignettes, peer consultation, and role-playing. Instructors are Thomas Bowman, Claudia Koshinsky Clipsham, Sarah Landy, and Mirek Lojkasek. Contact Division of Continuing Education, Room 107, Joseph E. Atkinson Faculty of Liberal & Professional Studies, York University, 4700 Keele Street, Toronto, ON M3J 1P3, tel: (416) 736-5616; fax: (416) 650-8042; e-mail: DCE@yorku.ca; www.atkinson.yorku.ca/~dce.

NEW from ZERO TO THREE's
creators of *Learning & Growing Together!*

LEARNING & GROWING TOGETHER WITH FAMILIES VIDEO PACKAGE



Relationships are at the core of all quality services provided to young children and their families. Designed for home visitors, Early Head Start staff, early intervention specialists, child care providers, and others who work with the families of young children, the *Learning & Growing Together With Families Video Package* will help you learn specific ways to build strong, collaborative relationships with families and with colleagues including:

- Self-awareness;
- Sensitive observation and careful reading of cues; and
- Flexible response.

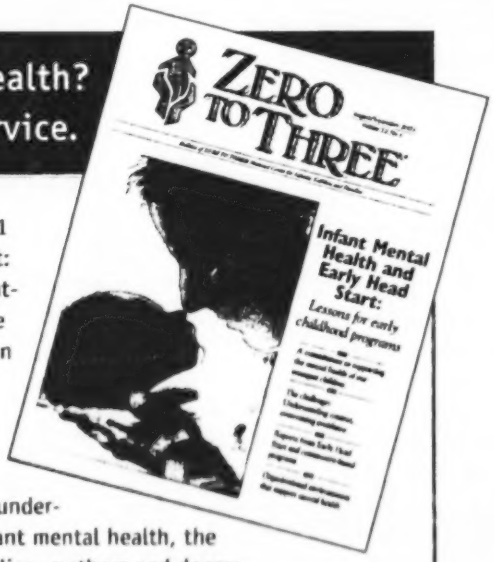
THIS VIDEO TRAINING PACKAGE FEATURES:

- *Learning & Growing Together With Families: Partnering With Parents to Support Young Children's Development*, a book by Jeree Pawl and Amy Dombro **AND**
- *Learning & Growing Together With Families: Seven Ways to Build Strong Relationships*, a 25-minute video with accompanying video guide.

Order a copy today by calling **1-800-899-4301** or on-line at **www.zerotothree.org**

Learning & Growing Together with Families Video Package (publication #V500-jrn) available December 2001 for **$69**. *Partnering With Parents to Support Young Children's Development* (publication #262-jrn) is sold separately as well for only **$14.95**.

Need Information on Infant Mental Health? Our Latest Issue is at Your Service.



Learn the latest on Infant Mental Health from the August/September 2001 issue of *Zero to Three* entitled, "Infant Mental Health and Early Head Start: Lessons for early childhood programs." This issue of *Zero to Three* is an outgrowth of the October 2000 Head Start Forum. The contributors, who were also presenters at the Forum, offer readers new research-based information about the mental health of very young children and their families.

They present guidelines for practice and strategies for building the organziational capacity to do this difficult work. Some exciting topics discussed include getting to a shared definition of infant mental health, understanding context and overcoming avoidance, fathers as facilitators of infant mental health, the socio-emotional context of infant mental health in African American families, mothers and depression, and relationships for learning.

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Upcoming Issues

December 2001/January 2002—Infants, Toddlers, and Terror: This issue will describe the post-September 11 experiences of infants, toddlers, families, and of the practitioners, programs, and organizations that have offered immediate and ongoing support. A special feature of the issue will be first-hand reports from more than two dozen professionals and organizations around the country, describing the circumstances of the children and families they work with, the resources they have developed or mobilized, and the ways they are supporting each other.

February/March 2002—The Importance of Family and Caregiving Routines: In this issue, Lorraine Kubicek (University of Colorado Health Sciences Center), Guest Editor, and other contributors will examine the links among everyday routines, the quality of infant/caregiver relationships, and children's competence. They will look at cultural variations, the impact of parental psychopathology, how families adapt routines for young children with disabilities, routines as a way of regulating behavior and promoting feelings of belonging in child care settings, the rituals of reading and storytelling, and strategies for helping families maintain competence through meaningful rituals.

April/May 2002—Agents of Change for Infants and Toddlers in Foster Care: This issue will focus on how individuals and groups, in different roles and circumstances, are making thoughtful efforts to improve outcomes for individual children and to change systems, with promising results. Contributors will include, among others, Randy Comfort; Mary Dozier; Sheryl Dicker and Elysa Gordon; Megan Gunnar; Martha Grace, Cindy Lederman, and Joy Osofsky; Teresa Jacobsen; Diana Kronstadt; Julie Larrieu; and Judith Silver.

The Editorial Mission of the *Zero to Three* Bulletin

To provide a forum for thoughtful discussion of important research, practice, professional development, and policy issues in the multidisciplinary infant, toddler and family field.

The Mission of ZERO TO THREE: National Center for Infants, Toddlers and Families

ZERO TO THREE is a national nonprofit whose mission is to promote the healthy social, emotional and intellectual development of our nation's infants and toddlers by supporting and strengthening families, communities, and those who work on their behalf.

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